COMPAQ Contura
Family of Personal Computers

User's Guide

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USER'S GUIDE

COMPAQ Contura Family of Personal Computers

Third Edition (February 1993)
First Edition (June 1992)
Part Number 141989-003

Compaq Computer Corporation

FEDERAL COMMUNICATIONS COMMISSION NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio or television technician for help.

Modifications

The FCC requires the user to be notified that any changes or modifications made to this device that are not expressly approved by Compaq Computer Corporation may void the user's authority to operate the equipment.

Cables

Connections to this device must be made with shielded cables with metallic RFI/EMI connector hoods to maintain compliance with FCC Rules and Regulations.

Trackball FCC Compliance Statement

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CANADIAN NOTICE

This equipment does not exceed the Class B limits for radiated emissions as described in the Radio Interference Regulations of the Canadian Department of Communications.

AVIS CANADIEN

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numeriques de la Classe B prescrites dans le Règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

GERMAN NOTICE

The COMPAQ Series 2820 Family of Personal Computers, when combined with one of the COMPAQ Family of Enhanced Keyboards and Video Graphics Color Monitor, Video Graphics Monochrome Monitor, Reduced Emissions Video Graphics Color Monitor, or QVision Family of Color Monitors – meets the requirements of ZH 1/618 (German Safety Regulations for Display Work Places in the Office Sector). The installation guides included with the monitors provide configuration information. When used as a workstation with a Compaq recommended external keyboard and monitor, the notebook computers are not intended for use in the operator's field of vision as defined in ZH 1/618.

HINWEIS

Hiermit wird bescheinigt, daß die COMPAQ Serie 2820 in Übereinstimmung mit den Bestimmungen der BMPT-AmtsblVfg 243/1991 funk-entstört ist. Der vorschriftsmäßige Betrieb mancher Geräte (z.B. Meßsender) kann allerdings gewissen Einschränkungen unterliegen. Beachten Sie deshalb die Hinweise in der Bedienungsanleitung.

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HOW TO USE THIS GUIDE

The *COMPAQ Contura Family of Personal Computers User's Guide* is a comprehensive reference containing procedures to help you get started and use your computer.

Each COMPAQ Contura model has powerful microprocessing performance to support applications such as word processing, spreadsheets, project management, or field automation application requirements.

If you are an experienced user, you may want to use the quick setup instructions in Chapter 1, "Setup Instructions." If you haven't set up a computer before, use the more detailed instructions beginning on page 1-3 of Chapter 1. Even if your Authorized COMPAQ Reseller has installed options or application software for you, read through this *User's Guide*. The more you know about your computer, the easier it will be to use its features and power.

SYMBOLS AND CONVENTIONS

The following format conventions distinguish elements of the text throughout the guide:

- Key names appear in a boldface type looking very much the way they appear on the actual keyboard. For example, **Home**, **End**, **Backspace**, or **Tab**.
- When keys must be pressed at the same time, the action is represented by the key names and the plus (+) symbol. For example, **Ctrl+Alt+Delete**.
- The names of files are presented in uppercase, italic type as shown here: *FILENAME*.
- The names of commands or directories are presented in uppercase type as shown here: COMMAND or DIRECTORY. Commands that are to be entered at the system prompt are shown on a separate line.
- When you are asked to type something without pressing the **Enter** key, you are directed to "type" the information.
- When you need to type information and press the **Enter** key, you will be directed to "enter" the information.

The following words and symbols mark special messages throughout this guide:

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

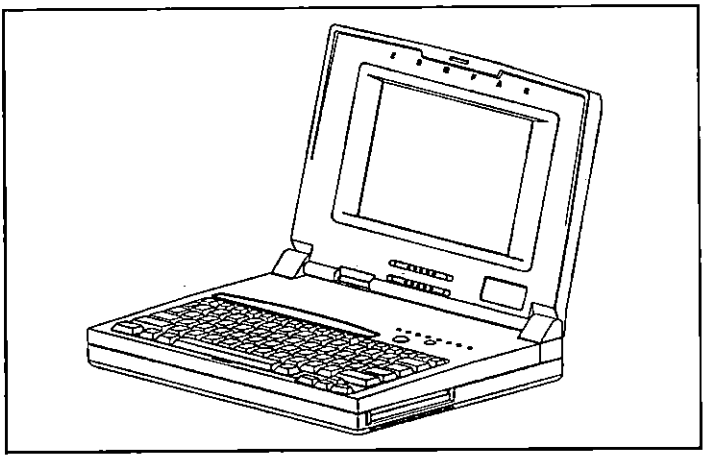
CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of information.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set in this manner presents commentary, sidelights, or interesting points of information.

SETUP INSTRUCTIONS

Your computer has an array of standard features including preinstalled software and device drivers. An online help program is also preinstalled to provide hardware and software information. In this chapter, you'll learn how to get started by installing and charging your battery pack. Then, you'll be prompted to choose your hardware and software configurations.



COMPAQ Contura Personal Computer

Before you begin, check to be sure you've removed everything from the packing carton. In addition to this guide, you need the following items to set up your computer:

- AC Adapter and power cord
- Battery pack
- COMPAQ Trackball (with selected models)
- Any application software you want to install

NOTE: If you need to install or reinstall all of your software, refer to Chapter 6, "Reinstalling Software On The Hard Drive," in this guide for procedures.

SETUP STEPS FOR THE EXPERIENCED USER

The following procedures summarize the steps needed to set up your computer. These steps are recommended for the experienced user.

NOTE: If you are installing internal options, do so now. Refer to Chapter 4, "Adding Options and Connecting Peripherals," and the installation guide that came with your option for information on how to install it in your computer.

1. Install the battery pack into the battery compartment on the bottom side of the computer.

WARNING: This equipment is designed for connection to a grounded (earth) outlet. The grounding type plug is an important safety feature. To avoid risk of electric shock or damage to the equipment, do not disable this feature.

2. Connect the AC power cord to the AC Adapter.
3. Plug the AC power cord into a properly grounded AC outlet that is located as near to the computer as possible, then connect the AC Adapter to the connector on the rear of the computer.
4. Open the computer.
5. Charge the battery pack before using it for the first time.

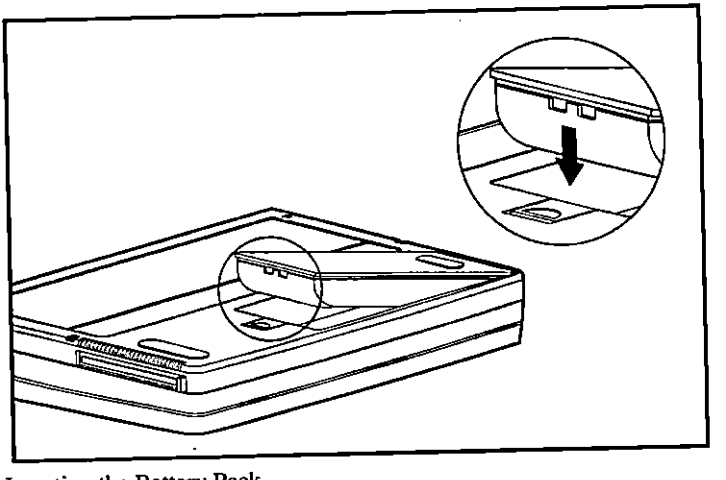
   Fast charging begins automatically if the battery pack is within normal operating conditions. Once the battery pack begins to fast charge, the fast charge light on the computer will stay on until the battery pack is fully charged.
6. Connect external devices, such as the External Numeric Keypad, trackball, mouse, or printer, to the computer.
7. Turn on the computer.
8. Follow the instructions on the screen.

SETUP STEPS FOR THE FIRST TIME USER

Installing the Battery Pack

Before using the computer, install and charge the battery pack. To install the battery pack, follow these steps:

1. Turn over the computer, bottom side up.
2. Slide the battery pack into the battery compartment until it locks in place.



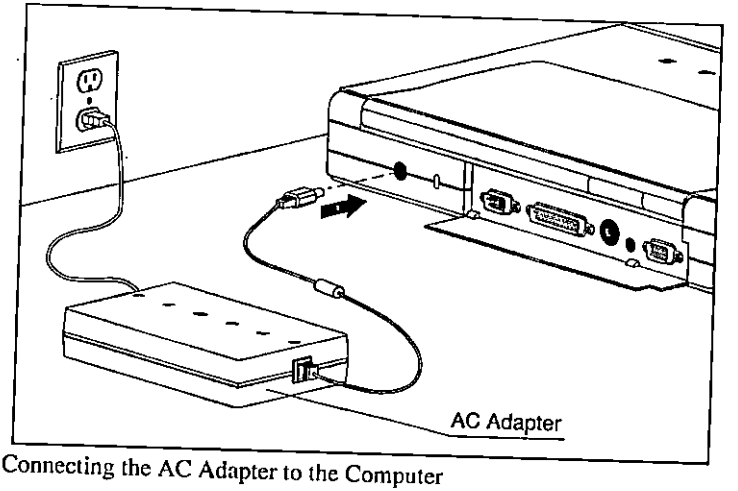
Inserting the Battery Pack

3. Turn the computer right side up.

NOTE: If you are adding internal options, do so now. Refer to Chapter 4, "Adding Options and Connecting Peripherals," and the installation guide included with your option for information on how to install it in your computer.

WARNING: This equipment is designed for connection to a grounded (earth) outlet. The grounding type plug is an important safety feature. To avoid risk of electric shock or damage to the equipment, do not disable this feature.

4. Connect the AC power cord to the AC Adapter.
5. Plug the AC power cord into a grounded AC outlet that is easily accessible and located as near to the computer as possible.
6. Connect the AC Adapter to the connector on the rear of the computer.



Connecting the AC Adapter to the Computer

IMPORTANT: Use the AC Adapter rather than the battery pack when you first set up your computer and install the application software. A low battery condition could interrupt the installation process.

7. Open the computer and raise the display.

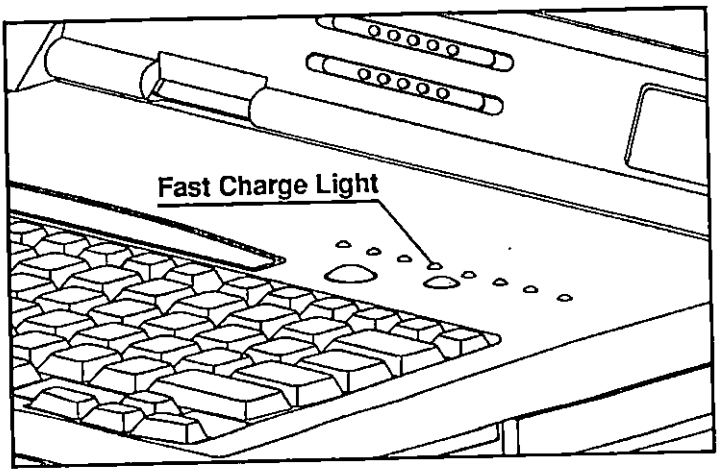
Charging the Battery Pack

The battery pack must be charged before it is used for the first time. The battery pack takes approximately 1 hour to charge with the computer turned off and 1 1/2 to 3 hours with the computer turned on.

NOTE: If you are using the Nickel Metal Hydride (NiMH) Battery Pack with the COMPAQ Contura 3/20 or COMPAQ Contura 3/25 Personal Computer, the battery pack must be charged with the computer turned off.

IMPORTANT: If you have an optional auxiliary battery installed, be sure it is also fully charged by leaving the AC Adapter connected to the computer overnight the first time you charge the battery pack. The auxiliary battery allows you to replace your battery pack without turning off the computer.

Fast charging begins automatically if the battery pack is within normal operating conditions. Once the battery pack begins to fast charge, the fast charge light on the computer will stay on until the battery pack is fully charged. If you install a battery pack that is already fully charged, the fast charge light turns on momentarily to indicate battery status, then turns off.



Fast Charge Light on the Computer

It's always a good idea to keep the battery pack in the computer when you're using it with AC power. This supplies the battery pack with a constant trickle charge and helps ensure that you'll have a fully charged battery when you need to operate the computer.

Setting Up the Computer

1. Connect any external devices, such as the External Numeric Keypad, trackball, mouse or printer to the connectors on the rear of the computer. Refer to Chapter 4, "Adding Options and Connecting Peripherals," for instructions on how to connect external options.

   NOTE: If you've purchased a mouse or trackball separately, it needs a software device driver to operate. Consult the documentation accompanying the device for instructions on installing the software driver and configuring the system. If a COMPAQ Trackball is included, the software drivers are installed.

2. Turn on the computer.
3. Follow the instructions on the screen.

THE OPERATING SYSTEM AND SUPPORT SOFTWARE

The computer comes preinstalled with the operating system, MS-DOS as published by Compaq, Microsoft Windows (on selected models), and support software utilities and device drivers. In addition, Compaq provides the operating system and utilities on diskettes along with your documentation. Store these diskettes in a safe place to use as a backup should you need to reload the software.

User Programs Support Software

The User Programs support software include utilities and device drivers that are specifically designed to enhance the performance of COMPAQ computers. These utilities customize the system for your operating system and application requirements. Refer to Chapter 5, "Diagnostics and Support Software Utilities and Device Drivers," for a list and description of the utilities.

Diagnostics

The SETUP, TEST, and INSPECT utilities in Diagnostics verify the proper operation of the computer, allow you to set custom features, and aid in troubleshooting. The SETUP utility is installed on the computer and provided on the Diagnostics diskette along with the TEST and INSPECT utilities. The Diagnostics diskette comes with computer.

Refer to Chapter 5, "Diagnostics and Support Software Utilities and Device Drivers," for additional information on Diagnostics.

EZ Help Online Library

The *EZ Help Online Library* is installed in your computer to provide quick access to information about how to use the computer. It includes information about User Programs DOS support software utilities and device drivers, frequently used MS-DOS commands, mouse software, and procedures on using the computer and optional equipment. It provides cross-reference links, search, browse, and index features. The *EZ Help Online Library* is for MS-DOS only and does not apply to other operating systems.

You can use the keyboard, a trackball, or a mouse to move within the *EZ Help Online Library*.

To access the online documentation:

1. Go to the system prompt and enter:

   HELP

NOTE: If you have Microsoft Windows preinstalled by Compaq, select the help icon in the COMPAQ Utilities group box to access the online documentation.

2. Select a book from the Book List and press the **Enter** key.

INSTALLING APPLICATION SOFTWARE

An application software program performs a specific task, such as database management, word processing, financial management, or graphic illustration. It is different than system software or operating systems, which maintain and organize the system.

Each application program usually includes its own installation program or has documentation that lists the computer requirements and explains the procedures to install the application. Before installing the application, read the documentation that came with the application to ensure that it meets disk space, memory, operating system, and monitor requirements of the computer.

CREATING A COMFORTABLE WORK ENVIRONMENT

Lighting, furniture, posture, and other work conditions may affect the way you feel and how effectively you work. By arranging these elements to meet your needs, you may be able to minimize fatigue and discomfort. While setting up the computer, take time to evaluate your work environment.

This section offers tips on the following topics:

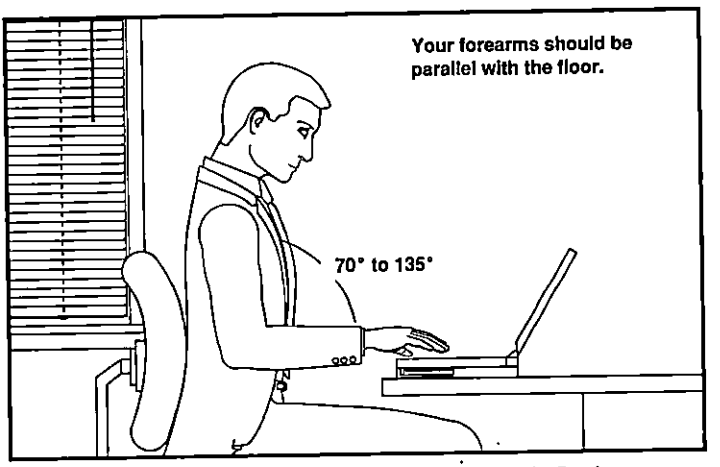
- Placement of the trackball and other input devices
- Viewing angle of the display
- Furniture and posture
- Lighting
- Vision care
- Work habits

CAUTION: It is in your best interest to set up a comfortable and healthy workstation. Misuse of your computer or failure to establish a safe and comfortable workstation could result in discomfort or serious injury.

Placement of the Input Devices

Input devices, such as a trackball, a mouse, or numeric keypad, should be positioned so that your arms and hands are in a relaxed, comfortable, and natural position. If you're using an external keyboard, place it in a comfortable position at your workstation.

- Select a work surface that is large enough to hold the computer equipment and any additional items required for your work.
- Position the computer keyboard directly in front of you. This makes it possible to type with your shoulders relaxed and your upper arms hanging freely at your sides.
- Adjust the height of your chair or work surface so your forearms form approximately a right angle with your upper arms.
- Minimize bending your wrist and keep your elbows near your body.
- If you are using a mouse or external keypad, be sure to allow enough room for free, unhindered movement.



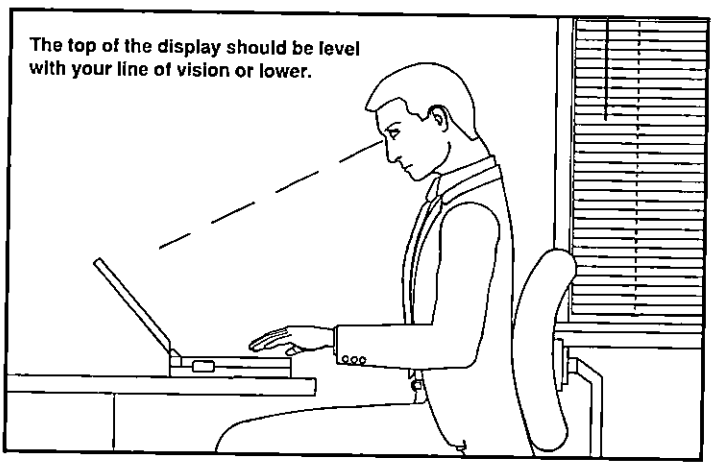
The Keyboard Needs to Be Positioned to Avoid Muscle Strain

Viewing Angle of the Display

If you place the display in the proper position and at the correct angle, you will reduce eye strain as well as muscle fatigue in your neck and shoulders.

Consider the following suggestions when determining how to position the display:

- Place the display directly in front of you at a comfortable viewing distance.
- While seated at the workstation, make sure that the top of the display is no higher than eye level. If the display is too high, you may want to move your computer to another location.
- Position the display to avoid sources of glare or any bright reflections.
- Use the tilting feature of your display to find the best position. You may want to tilt the display back slightly so that the screen meets your gaze.
- Use the display's brightness and contrast controls to improve character and image quality.
- If you use a document holder, locate it at the same level and viewing distance as the display.



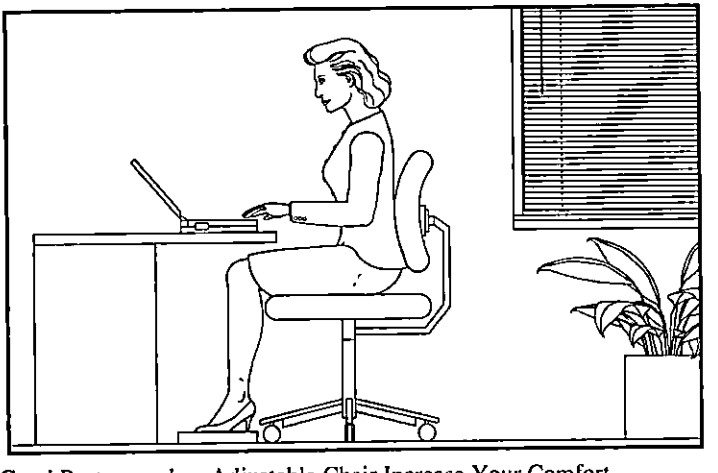
Correct Placement of the Display Increases Your Comfort

Furniture and Posture

Adjust your furniture to meet your needs for comfort. If the workstation table is adjustable, move it to the proper height. If it is not adjustable, then arrange the chair to suit your needs.

A properly adjusted chair can add to your comfort by supporting good posture. Remember the following when you select and arrange your chair:

- Make sure that your chair is the proper height. You should be able to maintain your proper arm position and place your feet on the floor. Your knees should be at the same level as your hips or slightly higher. Use a footrest if your chair is too high for your feet to rest firmly on the floor.
- When seated, avoid pressure along the underside of the thigh (near the knee) and the back side of the lower leg. Your knees should be slightly higher than your hips.
- Position the backrest so that your lower back is supported while you sit at the workstation.
- Adopt a relaxed, upright working posture and let the chair support you. Avoid slouching forward or leaning backward too far.
- Place your work materials within easy reach.

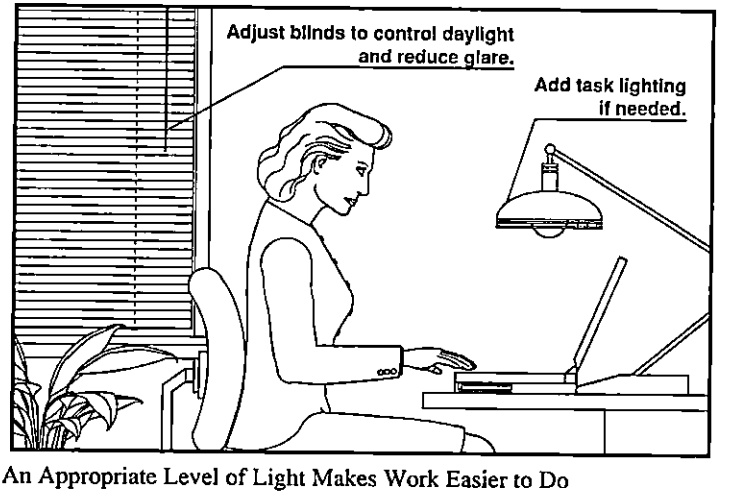


Good Posture and an Adjustable Chair Increase Your Comfort

Lighting

Correct lighting adds to your work effectiveness and comfort. Lighting should be arranged to support the type of work you do most often. For example, if most of your work is done sitting in front of the computer, then you should consider the following factors when arranging your lighting:

- If possible, position the equipment or sources of light so that glare or bright reflections on the display are minimized.
- If your office has windows, use blinds, shades, or drapes to control the amount of daylight in the room. Try locating the computer so that the side of the display faces the windows. This may help to minimize glare on the screen.
- Position the computer so that the display is between the rows of overhead lights to avoid glare.
- Combine the general and task lighting for your lighting needs, but avoid bright light sources in your field of vision.
- Use direct lighting to avoid bright spots on the display.



An Appropriate Level of Light Makes Work Easier to Do

Vision Care

When working at your computer for long periods of time, your eyes may become irritated and fatigued. Special attention should be given to vision care.

- Take frequent breaks and rest your eyes.
- Keep your glasses, contact lenses, and the display clean.
- If you use a glare filter, clean it according to the instructions.
- Have your eyes examined regularly by a vision care specialist.

Work Habits

The placement of furniture, office equipment, and lighting are not the only factors that determine how you feel at the end of a work day. Your work habits are also very important. Remember to do the following:

- Work in a relaxed, natural position. Avoid any awkward postures that may lead to muscular discomfort.
- Vary your tasks during the day so that you don't sit in one position for several hours.
- Alter your sitting posture frequently to reduce muscle fatigue.
- Avoid prolonged periods of forceful typing.
- Take periodic breaks when you work at your computer for prolonged periods. You may find that frequent, short breaks are of greater benefit than fewer, longer breaks.
- Stand up and take a few minutes to stretch and exercise several times a day.
- Examine your work habits and the types of tasks you perform. Break up the routine and try to perform a variety of tasks throughout the day.
- Be sensitive to the environment in which you are using notebook, laptop, or portable computers as application of these recommendations could vary based on the particular environment.

Many factors in our work environment determine whether we work efficiently and in a manner that promotes good health and safety. By occasionally evaluating the types of elements described in this section, it is possible to create a comfortable, healthy, and efficient environment.

NOTE: The suggestions included in this section are designed to help you find ways to work more comfortably and effectively. However, only you can determine the best working environment and workstation arrangement for your work.

Comfort Checklist

To increase your comfort, use this checklist to evaluate your workstation and work habits:

- Make sure your chair is at a height that allows you to maintain the proper arm and hand position. Be sure your chair supports your lower back. Rest your feet firmly on the floor.
- Avoid glare on your computer display by controlling the light in the room and by placing the computer in an appropriate position.
- Place the display so that the top of the display is at eye level or lower.
- Keep your forearms parallel with the floor when you type, forming approximately a 90 degree angle with your upper arms. Do not angle your forearms upward.
- Have your eyes examined regularly by a vision care specialist.
- Vary your tasks during the day so that you don't sit in one position for several hours.
- Stretch and exercise several times a day.
- Take periodic breaks when you work at your computer for prolonged periods.

For Further Information

If you would like more information about arrangement of work space and equipment, look for the topic, "ergonomics," in your local library.

INTRODUCING THE COMPUTER

This chapter identifies the computer components and discusses how to use and maximize its features.

DISPLAY

Passive Matrix Color VGA Display

The COMPAQ Contura 3/25c Personal Computer has a passive matrix color VGA display that supports VGA, EGA, and CGA graphics resolutions. It displays up to 16 colors in high-resolution mode (640 x 480) or 256 colors in low-resolution mode (320 x 200).

The COMPAQ Contura 3/25c provides a simultaneous display feature that allows you to view the computer display and an external display simultaneously. You can use the hotkey function to switch from the computer display to an external display and to simultaneous display. Read more about the hotkey functions in Chapter 3, "Special Features of the Computer."

Monochrome VGA Display

The monochrome VGA liquid crystal display on the COMPAQ Contura monochrome models support VGA, EGA, and CGA graphics resolutions and displays up to 16 shades of gray in high-resolution mode (640 x 480) or 64 shades of gray in low-resolution mode (320 x 200). The computers also support external VGA color monitors.

With the monochrome display, you can toggle between normal and reverse video. This feature lets you view dark text on a light background (normal video) or light text on a dark background (reverse video) by pressing the hotkeys. You can also switch from the internal display to an external display using the hotkeys. See Chapter 3 for additional information on hotkey functions.

ADAPT

The color and monochrome displays take advantage of the ADAPT (Advanced Display Attribute Programming Tool) software utility. It enables you to adjust the gray shades or colors on the screen, thereby improving the readability of text and graphics. ADAPT also allows you to change cursor size and enable or disable the screen save feature.

Screen Save

The Screen save feature works under battery and AC power. After a predetermined period of inactivity, the screen goes blank; however, it restores with any keyboard or pointing device (such as a trackball or mouse) activity. You can use the PWRCON, SETUP, MODE, or ADAPT utility to customize the power conservation setting by changing the inactivity timeouts. Read more about these utilities in Chapter 5, "Diagnostics and Support Software Utilities and Device Drives," or the User Programs section of the *EZ Help Online Library*.

Extended Text

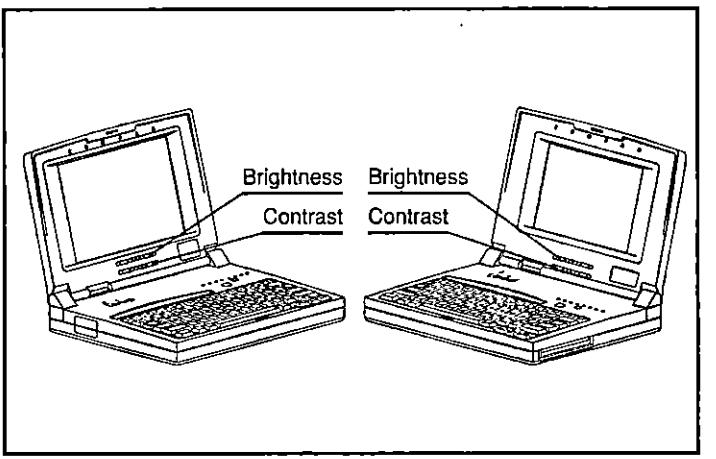
The Extended Text feature alters the way text appears on the computer display by allowing the blank areas at the top and bottom of the display to be eliminated. This feature applies only to applications that operate in text modes. The Extended Text default value is selected through the SETUP utility. Refer to Chapter 3, "Special Features of the Computer," for procedures on how to select this feature. Extended text is not supported when the computer is switched to simultaneous display or on external monitors.

Advanced VGA Resolution

The COMPAQ Contura personal computers support advanced VGA resolution mode (800 x 600 with 16 colors) when the required Microsoft Windows drivers are installed. This mode is available on external monitors that are capable of displaying advanced VGA resolution mode. The Windows User Programs support software diskette that came with your computer contains the drivers and utilities needed to support this mode.

Display Adjustments

The display has brightness and contrast controls to adjusts the light intensity and image of the screen. An adjustable viewing angle allows you to tilt the display to a comfortable viewing position.

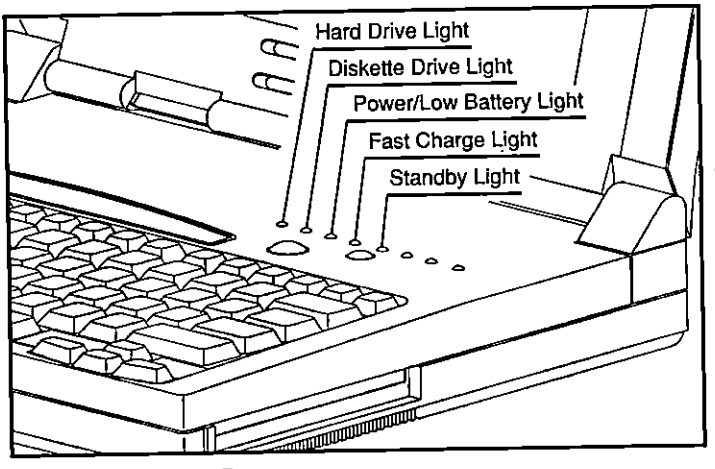


Monochrome and Color Displays

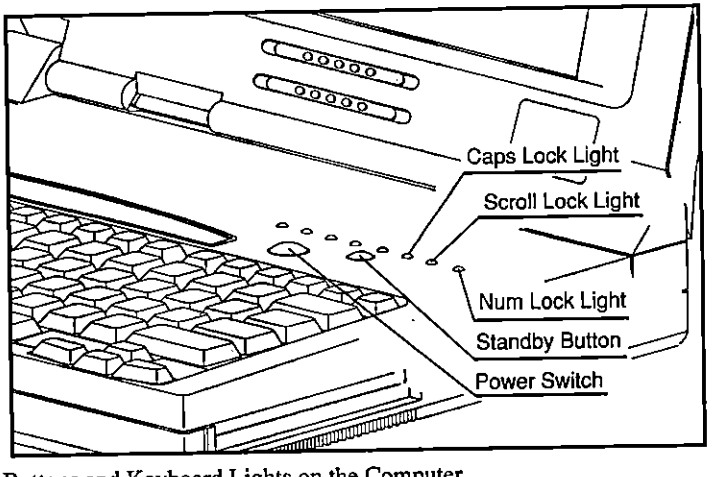
System Lights

Lights above the keyboard indicate when the computer is on, when a mass storage device is in use, when the battery is charging, when the computer is in the Standby mode, and when the **Caps Lock**, **Scroll**, and **Num Lk** keys are in use. Icons (picture representations) help you identify the purpose of the lights. The lights are described in the following table and shown in the following illustrations.

System and Keyboard Lights		
Light	**Color**	**Description**
Hard Drive	Green	Turns on when the hard drive is accessed
Diskette Drive	Green	Turns on when a diskette is accessed
Power/low battery	Green	Turns on when power to the computer is turned on; also indicates low battery 1 and low battery 2 conditions
Fast Charge	Green	Turns on when the battery pack is charging inside the computer
Standby	Green	Turns on when you or the computer initiates Standby
Caps lock	Green	Lights when the **Caps Lock** key is on
Scroll lock	Green	Lights when the **Scroll** key is on
Num lock	Green	Lights when the **Num Lk** key is on



System Lights on the Computer

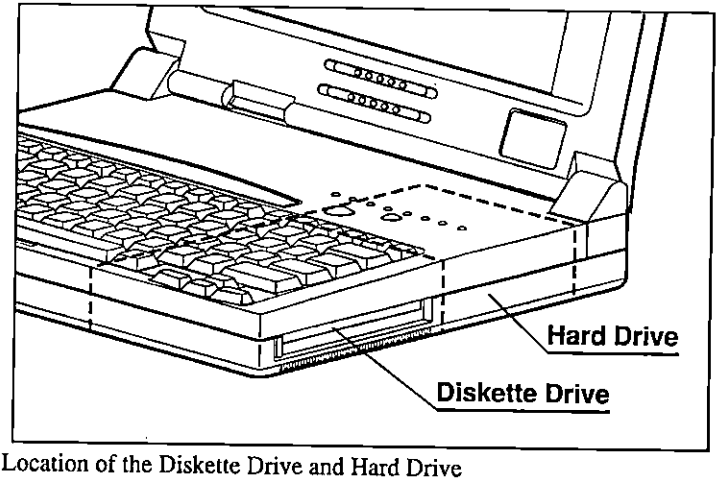


Buttons and Keyboard Lights on the Computer

MASS STORAGE DEVICES

Internal storage devices provide optimum performance, convenient storage, and portability. The computer comes with a high-density, 3 1/2-inch 1.44-Megabyte Diskette Drive and one of several hard drive capacities based on the model of your computer.

To determine the capacity of the hard drive in your computer, run the internal SETUP utility. The utility displays the system configuration summary that includes information on the type and size of the hard drive. Refer to Chapter 5, "Diagnostics and Support Software Utilities and Device Drivers" for instructions on running the SETUP utility.

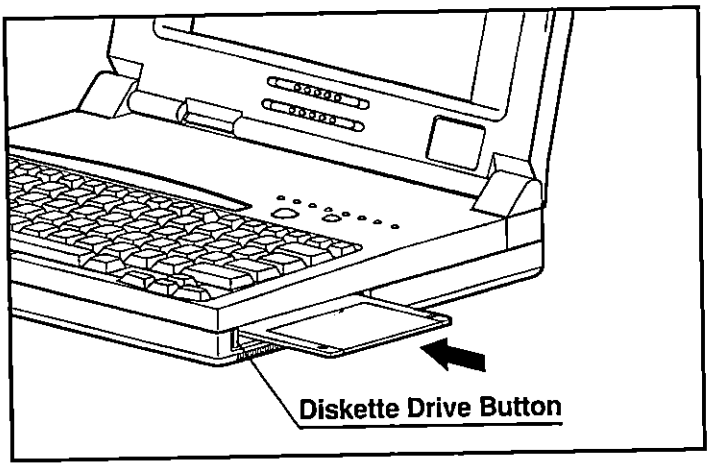


Location of the Diskette Drive and Hard Drive

The diskette drive is located on the right side of the computer. To insert a 3 1/2-inch diskette into the diskette drive, insert the diskette, label side up, into the drive until the drive clicks.

NOTE: If the diskette has been inserted correctly, it drops into position in the drive and the drive button pops out.

To remove the diskette, press the diskette drive button to eject the diskette. Remove the diskette from the diskette drive.



Inserting a 3 1/2-Inch Diskette

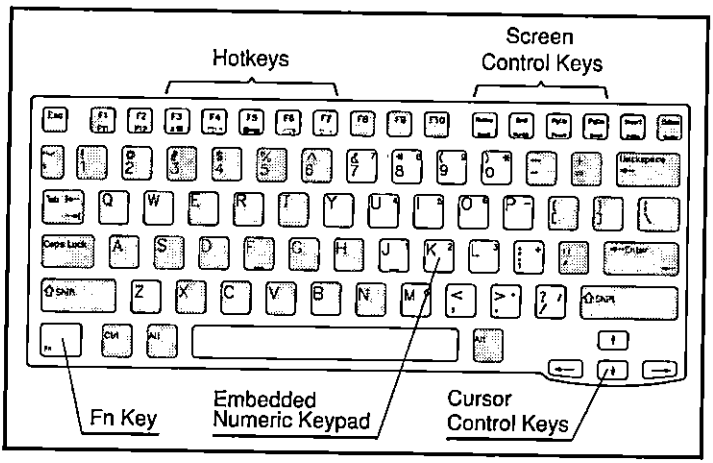
KEYBOARD

The keyboard provides specific notebook features including special feature hotkeys, **Fn** key, embedded numeric keypad, and dedicated cursor-control keys. The keyboard layout includes:

- Separate screen-control keys
  - **Home** key
  - **End** key
  - **PgUp** key
  - **PgDn** key
- Cursor-control keys
- Five special feature hotkeys for quick access to:
  - Reverse/normal video (monochrome display)
  - Switching displays
  - QuickLock/QuickBlank
  - Power conservation levels
  - Battery gauge

- **Fn** key that activates the hotkeys and accesses the embedded numeric keypad and Extended Text
- Dedicated cursor- and screen-control
- 12 Function keys
- 101-/102-Key keyboard compatibility
- Embedded numeric keypad

Some key sequences differ slightly on computers with national keyboards. Refer to Chapter 3, "Special Features of the Computer," for detailed information about using the keyboard.



Keyboard Layout

Function Key Template

Your computer provides a blank template located above the keyboard function keys. Use the template to write on to record special key functions for applications you use most often.

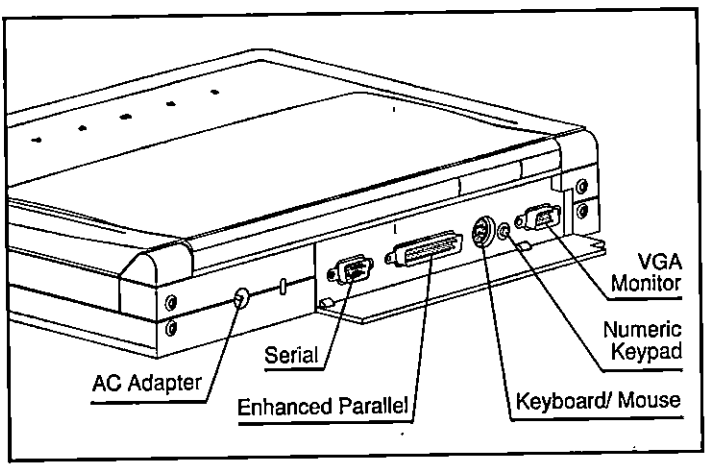
IDENTIFYING EXTERNAL CONNECTORS

The external connectors are located on the rear of the computer and allow you to connect external devices to your computer such as a monitor, printer, trackball or mouse, Automobile Adapter, AC Adapter, and Enhanced Keyboard. Pull down the connector cover to expose the connectors.

IMPORTANT: When the external connectors are not being used, keep the connector cover closed to protect against a discharge of static electricity and possible damage to the computer.

The following external device connectors are on the rear of the computer. Icons help you identify the connectors.

- Enhanced parallel
- Serial
- VGA monitor
- Numeric keypad
- Keyboard/mouse
- AC Adapter



Connectors

For more information about connecting optional equipment, refer to Chapter 4, "Adding Options and Connecting Peripherals," or the documentation accompanying the device.

Cable Lock Provision

Your computer features a slot on the rear that accommodates a special cable and lock making it possible to physically secure the computer any place.

Refer to Chapter 3, "Special Features of the Computer," for more information on security features.

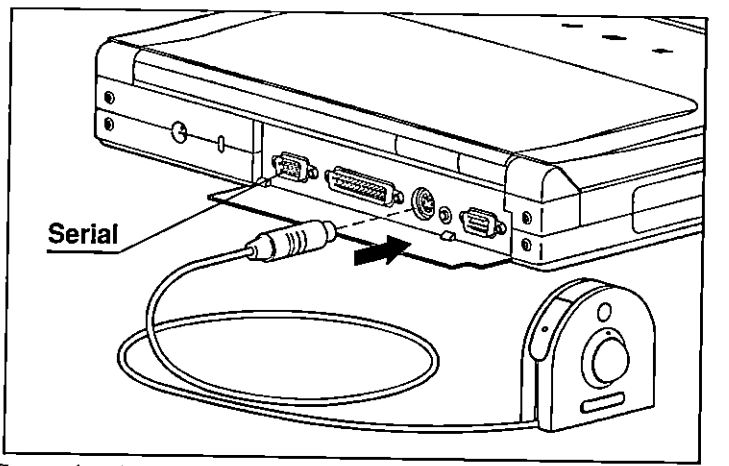
COMPAQ TRACKBALL

Some COMPAQ Contura models include a COMPAQ Trackball that allows easy and effective use with DOS- and Windows-based applications. You can use the trackball by placing it on your desk, attaching it to the computer with an attaching device, or by holding it in your hand. It performs the basic pointing device functions like pointing, clicking, double-clicking, and dragging. Refer to Chapter 7, "Traveling with Your Computer," for procedures for maintaining your trackball.

Connecting the COMPAQ Trackball

To connect the trackball to the computer, follow these steps:

1. Turn off the computer.
2. Open the connector cover on the rear of the computer.
3. Connect the trackball to the keyboard/mouse connector.



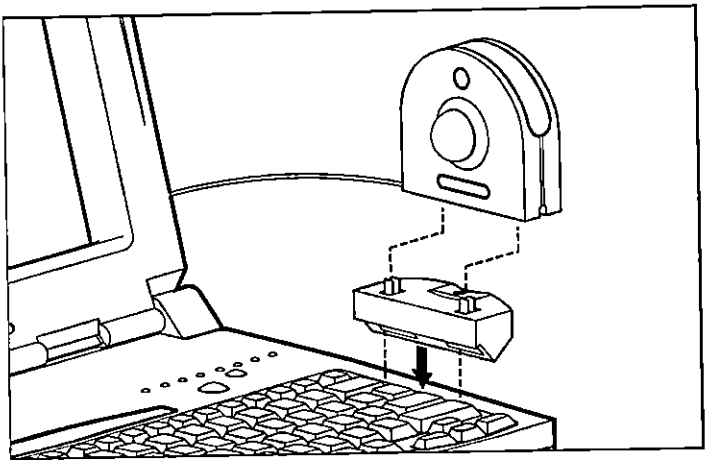
Connecting the COMPAQ Trackball

4. Turn on the computer.

Attaching the COMPAQ Trackball

To attach the trackball to the computer, follow these steps:

1. Press the button on the attaching device. The clip extends.
2. Attach the clip onto either side of the keyboard and release the button. The attaching device fits snugly onto the computer.
3. Snap the trackball onto the attaching device.



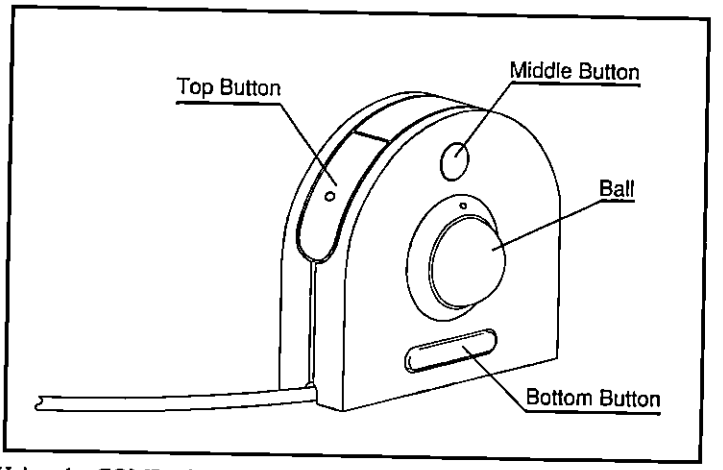
Attaching the COMPAQ Trackball to the Computer

Refer to the *EZ Help Online Library* for information on how to adapt the trackball for left-handed use.

Using the COMPAQ Trackball

To use the trackball, follow these steps:

1. Hold the trackball with the cable pointing away from you.



Using the COMPAQ Trackball

2. Position your index finger at the top of the trackball so you can click the top button.
3. Use your thumb to roll the ball and to click the middle and bottom buttons.

To practice basic DOS application skills with the trackball, go to the \MOUSE directory and enter

```
MTUTOR
```

to use the mouse tutorial.

Mouse Software If a COMPAQ Trackball is included with the computer, software for both DOS and Windows applications is installed to operate the trackball.

Use the Windows mouse control panel to change your trackball's tracking speed, double-click speed, button swap, drag-lock assignment, and orientation. To access the Windows control panel, go to the main group box, double-click the Control Panel icon, then double-click the Mouse/Trackball icon. Use the DOS control panel to set sensitivity level, ballistic effect, drag-lock effect, cursor enhancement options, and button swap. To access the DOS control panel, type CLICK at the system prompt and press the **Enter** key.

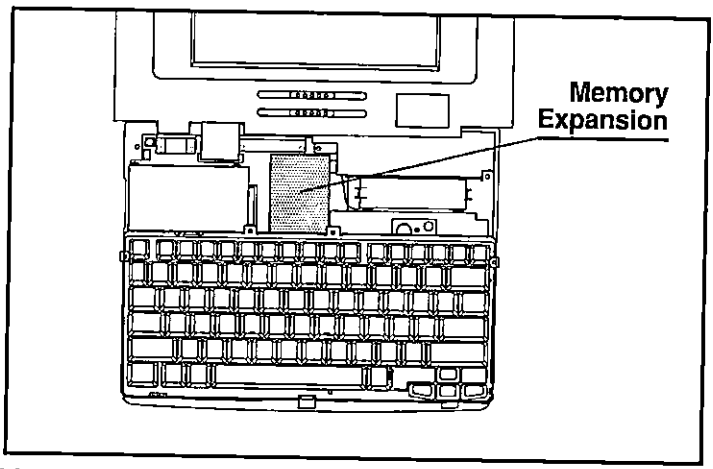
Refer to the *EZ Help Online Library* by typing HELP at the system prompt or clicking on the help icon for more information on trackball features and how to use them.

MEMORY

The COMPAQ Contura 4/25 models come with four megabytes of high-speed 32-bit system memory, the COMPAQ Contura 3/25c and COMPAQ Contura 3/25 models come with four megabytes of high-speed 16-bit system memory while the COMPAQ Contura 3/20 models come with two megabytes.

Memory can be increased by adding an optional memory expansion board to an internal memory connector inside your computer. The following table shows how system memory can be increased by adding memory options. Refer to the installation instructions included with the memory option for information on how to install the memory expansion board.

Memory Expansion			
Computer	**System Memory**	**Memory Expansion Board**	**Total Memory**
COMPAQ Contura 4/25	4 MB	16 MB	20 MB
		8 MB	12 MB
		4 MB	8 MB
COMPAQ Contura 3/25c	4 MB	8 MB	12 MB
		4 MB	8 MB
		2 MB	6 MB
COMPAQ Contura 3/25	4 MB	8 MB	12 MB
		4 MB	8 MB
		2 MB	6 MB
COMPAQ Contura 3/20	2 MB	8 MB	10 MB
		4 MB	6 MB
		2 MB	4 MB



Memory Expansion

CACHE

The cache design allows fast interaction between the microprocessor and frequently used memory to provide increased performance. The capabilities of the 25-MHz 486SL microprocessor in the COMPAQ Contura 4/25 is optimized with 8-Kbytes of internal cache. The COMPAQ Contura 3/25c and Contura 3/25 models, with 25-MHz 386SL microprocessors, are maximized with a 64-Kbyte four-way set-associative cache memory.

POWER SUPPLIES

Your computer operates on DC power from either an internal battery or external power source.

Internal Power

The computer comes with either an Enhanced Nickel Cadmium (NiCd) Battery Pack or a Nickel Metal Hydride (NiMH) Battery Pack and unique power conservation features that provide more than 3 hours of system operation under typical use. The computers come with different types of battery packs but each type can be used in all of the computers.

	Battery Packs	
Computer	**Standard Battery Pack**	**Optional Battery Packs**
COMPAQ Contura 4/25	Enhanced NiCd	Enhanced NiCd, NiMH
COMPAQ Contura 3/25c	NiMH	Enhanced NiCd, NiMH
COMPAQ Contura 3/25	Enhanced NiCd	Enhanced NiCd, NiMH
COMPAQ Contura 3/20	Enhanced NiCd	Enhanced NiCd, NiMH

Having an extra battery pack on hand allows you to extend the operating time of the computer when the primary battery pack runs low. An optional internal auxiliary battery lets you place your computer in Standby and replace the battery pack without turning off the computer.

Displaying the battery gauge in the corner of the screen while you work lets you know when to make the easy switch from one battery pack to another. The battery gauge calculates the approximate amount of battery power remaining. You'll also know when your battery power is low by the blinking power/low battery light on your computer and a series of warning beeps from the speaker. It reminds you to save your data and change the battery pack or connect external power. Read more about the battery gauge later in this chapter.

External Power

The computer also comes with an AC Adapter that converts AC power from a standard electrical outlet to the DC power that the computer requires. The AC Adapter plugs directly into the computer allowing you to use the computer and charge the battery pack at the same time. An optional Automobile Adapter also serves as a power supply that allows you to work and charge the battery pack at the same time.

USING THE AC ADAPTER AND BATTERY PACK

This section explains how to use the AC Adapter to supply power to the computer and charge the battery pack. Because efficient use of the battery pack is key to computer performance and portability, this section provides guidelines for using the battery pack and tells how to make the most of the battery power available.

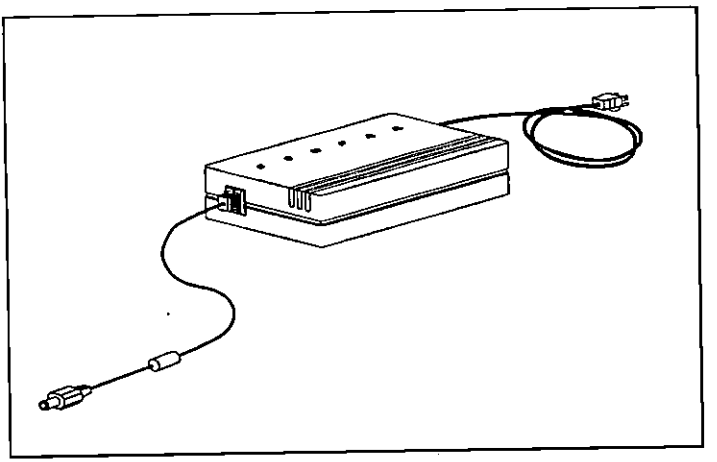
The computer operates on DC power from the following sources:

- AC Adapter, which is included with your computer
- Enhanced Nickel Cadmium (NiCd) Battery Pack
- Nickel Metal Hydride (NiMH) Battery Pack
- Automobile Adapter, which is optional

AC Adapter

The AC Adapter is a self-contained power supply that converts alternating current (AC) to the direct current (DC) required by the computer. It has a wide-range input that accepts line voltages from 100 to 270 volts AC.

When the AC Adapter is connected to the computer and a grounded AC outlet, it powers the computer and charges the battery pack–even while you're working.



AC Adapter

Charging the Battery Pack

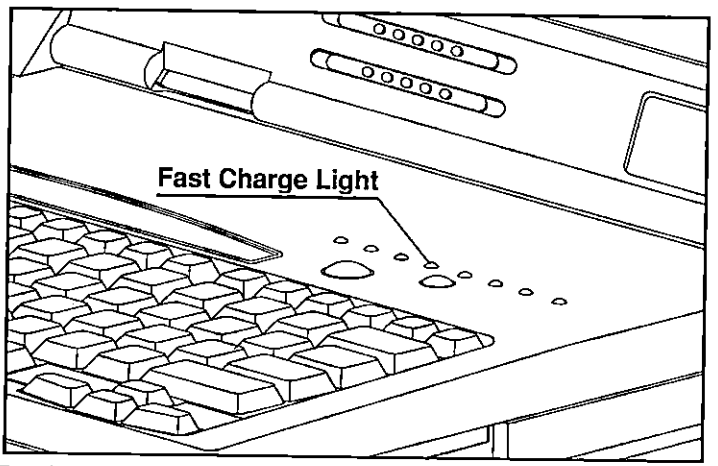
The AC Adapter charges the battery pack in two ways: with a fast charge and a slower trickle charge.

Fast Charging

A fast charge provides a relatively high current to the battery pack until it reaches full capacity. Fast charging a fully discharged battery pack takes about 1 hour if the computer is turned off and 1.5 to 3 hours if it is being used under typical operating conditions.

NOTE: If you are using the NiMH battery pack with the COMPAQ Contura 3/20 or COMPAQ Contura 3/25, the battery pack must be charged with the computer turned off.

The fast charge light on the computer turns on when a fast charge begins and turns off when the battery is fully charged, then switches to a trickle charge. If the battery pack is not fully charged, fast charging occurs anytime the AC Adapter is connected to the computer and an AC outlet.



Fast Charge Light on the Computer

Fast charging may not occur if the battery pack temperature is not within normal operating range (between 50°F and 104°F [10°C and 40°C]) or below normal discharge levels that can occur after an extended period of nonuse. Once the battery pack begins fast charging, the fast charge light on the computer will stay on until the battery pack is fully charged.

Trickle Charging

Trickle charging, which is not affected by temperature, is much slower than fast charging. When the battery pack is fully charged, the current switches to trickle charge to protect the battery pack from overcharging and to maintain the battery pack in a fully charged condition. As long as the AC Adapter is connected to the computer and to an AC outlet, the battery pack receives an ongoing trickle charge to keep it fully charged.

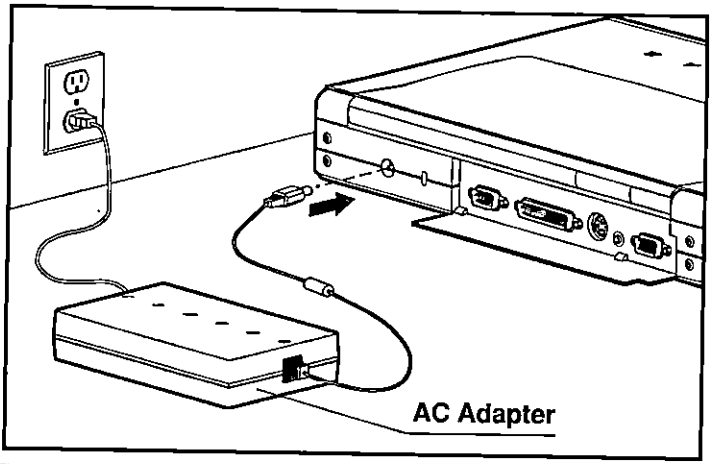
Connecting the AC Adapter to the Computer

To connect the AC Adapter to the computer, follow these steps:

> **WARNING:** This equipment is designed for connection to a grounded (earth) outlet. The grounding type plug is an important safety feature. To avoid risk of electric shock or damage to your equipment, do not disable this feature.

1. Connect the AC power cord to the AC Adapter.
2. Plug the AC power cord into a grounded AC outlet that is easily accessible and located as near to the computer as possible.
3. Connect the AC Adapter cable to the AC Adapter connector on the back of the computer.
4. Turn on the computer, if it's not already on.

NOTE: You can switch from battery power to the AC Adapter without turning off the computer or losing your information. The computer senses the change and readjusts accordingly.



Connecting the AC Adapter to the Computer

It's always a good idea to keep the battery pack in the computer when you're using it with AC power. This supplies the battery pack with a constant trickle charge and helps ensure that you'll have a fully charged battery pack when you need it to operate the computer.

USING BATTERY POWER

The battery pack supplies internal power to the computer, making it truly portable. This section discusses the battery pack, battery operating time, power management, the battery gauge, battery storage, and resolving low battery conditions.

WARNING: Do not crush, puncture, incinerate, or short external contacts. Do not attempt to open or service the battery pack.

NOTE: Disposal of all Enhanced NiCd or NiMH Battery Packs should be done in accordance with the local regulations or returned to Compaq by an established parts return method.

Increasing Battery Operating Time

Battery operating time varies depending on the system components, options, and applications being used. Under typical conditions, a fully charged battery pack provides more than 3 hours of operating time. You can maximize battery operating time by using the Power Conservation feature, which controls the energy required by the computer.

To minimize the energy required by the computer, consider the following:

- Use the **Fn** + **F6** special feature hotkeys to set the power conservation level to "high." This adjustment increases operating time under typical operating conditions.
- Use the PWRCON or SETUP utility to customize the power conservation settings to work more efficiently with your applications. The time you add depends on the values you select.

To maximize the energy stored in the battery pack, consider the following:

- Discharge and recharge the battery pack at least once every 60 days. This ensures optimal battery performance. The battery pack does not have to be fully charged before it is discharged and recharged.
- Keep the battery pack in the computer when you're using it with AC power. This supplies the battery with a constant trickle charge.
- Store the battery pack in a cool, dry place when it's not in use.

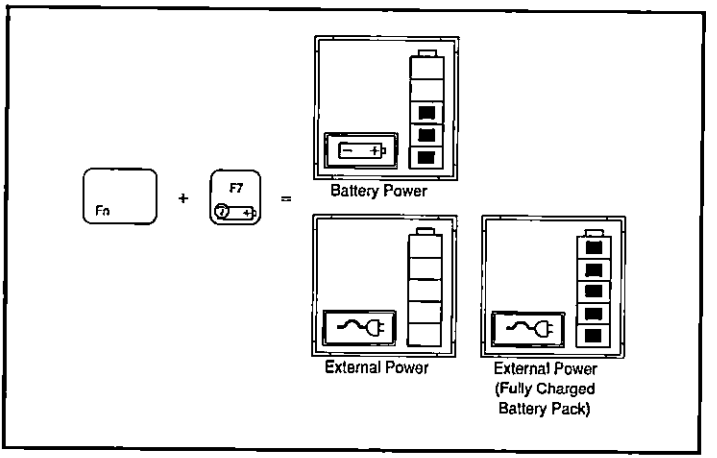
Advanced Power Management

Some COMPAQ Contura models are designed with a power management system called Advanced Power Management (APM). APM is a system specification that allows applications, operating systems, and the computer basic input/output system to work together to reduce power consumption in the computer. APM allows you to increase your productivity and system availability by extending the life of the battery pack without sacrificing performance.

Using the Battery Gauge

The battery gauge displays the approximate amount of battery power remaining. The amount remaining increases or decreases depending on the demands of the application or operating system software on various computer components. Under typical operating conditions, the battery gauge is accurate within 20 percent.

The battery gauge popup window can be displayed at any time and from within any application. The bar graph indicates the percentage of battery power remaining.



Battery Gauge

Discharging the Battery Pack

To discharge the battery pack, follow these steps:

1. If connected, disconnect the AC Adapter (or other power source) from the computer.
2. Turn on the computer if it's turned off.
3. Use the **Fn** + **F6** special feature hotkeys to turn off power conservation by selecting the drain level from the popup window.
4. Leave the computer on until it discharges.

If you'd prefer, leave your computer on overnight to discharge it completely. The power/low battery light turns off when no charge remains.

The optional Battery Fastcharger/Discharger discharges a fully charged battery pack in approximately 4 hours. Refer to Chapter 4, "Adding Options and Connecting Peripherals," for more information on optional equipment for your computer.

Recharging the Battery Pack

Once the battery pack is discharged, fully recharge it. To do so, follow these steps:

1. Connect the AC Adapter (or Automobile Adapter) to the computer.
2. When the fast charge light on the computer turns off, the battery pack is fully charged.

Remember, it takes about 1 hour to fast charge the battery pack if the computer is turned off and 1.5 to 3 hours to charge a fully discharged battery pack with the computer on. The optional Battery Fastcharger/Discharger charges a fully discharged battery pack in approximately 1 hour. Refer to Chapter 4, "Adding Options and Connecting Peripherals," for more information on optional equipment for your computer.

Storing the Battery Pack

Store the battery pack in a cool, dry place. High temperatures cause a battery pack to lose its charge more quickly, and excessive heat can reduce overall battery life. Use the following temperature ranges for battery storage:

NiCd	-4° to 122° F	-20° to 50° C
NiMH	-4° to 86° F	-20° to 30° C

Replacing the Battery Pack

If you need to replace the battery pack, use the following procedures to remove one battery and insert another.

NOTE: If you have an optional Auxiliary Battery installed, follow the procedure in "Replacing the Battery Pack with the Auxiliary Battery Installed."

To remove the battery pack:

1. Save your information and exit the application.

2. Turn off the computer.
3. Open the battery compartment by sliding the battery release latch to the outside. The battery pack springs out.
4. Remove the battery pack.

To insert a new battery pack:

1. Insert the battery pack into the battery compartment.
2. Turn on the computer.
3. Continue your work.

Replacing the Battery Pack with the Auxiliary Battery Installed

The optional Auxiliary Battery provides battery power during Standby to allow you to replace the battery pack without turning off the computer. To replace a battery pack with an Auxiliary Battery installed, follow these steps:

1. Leave the computer on.
2. Initiate Standby by pressing the standby button on the computer.
3. Wait for the standby light to turn on.
4. Open the battery compartment by sliding the battery release latch to the outside. The battery pack springs out.

   To prevent possible loss of information in memory, you must insert a charged battery pack in the computer *within one minute* of removing the discharged battery pack.
5. Insert the new battery pack into the battery compartment.
6. Press the standby button.
7. Continue your work.

Low Battery Conditions

The computer recognizes two low battery conditions:

Low Battery 1 and Low Battery 2

To prevent loss of information, it is important that you save whatever you are working on as soon as the computer enters a low battery condition. However, it is not always necessary to resolve a low battery condition immediately. With your information protected, you may choose to continue working.

Discharging the battery pack on a regular basis is essential to ensure the highest level of battery performance. Occasionally allow the computer to discharge the battery pack until it reaches Low Battery 2. At that point, you should resolve the low battery condition as directed in the following.

Low Battery 1 Your computer enters Low Battery 1 when the battery pack has approximately 6 percent of its charge remaining. When this occurs, you are then alerted with the following signals:

- The power/low battery light flashes once every second.
- The speaker beeps six times (unless the beeps are disabled).

Low Battery 2 The computer enters Low Battery 2 when the battery pack has approximately 3 percent of its charge remaining. You are then alerted with the following signals:

- The speaker beeps rapidly 12 times.
- The power/low battery light flashes twice every second.

Low Battery Standby When the computer is unattended and in Low Battery 1 or 2 for a short time, it initiates Standby to conserve the remaining battery power.

Beeps for low battery warnings and Standby can be disabled through the SETUP and PWRCON utilities.

IMPORTANT: If the lights indicate a low battery condition but the speaker does not beep, the beeps may have been disabled.

System-Initiated Hibernation Hibernation allows you to protect your information indefinitely once you allocate the necessary hard disk space. Hibernation is a feature that must be turned on using the PWRCON utility. If Hibernation is turned on, it initiates after a specified period of time in Standby or at Low Battery 2 by saving data in memory to the hard drive and turning off the computer to conserve battery life. When power is available and you turn on your computer, your information returns to the screen at the point where Hibernation was initiated.

Discharged Battery If the Hibernation feature is not turned on and the battery pack is fully discharged before you save your information, that information is lost.

Resolving Low Battery Conditions

The following table contains descriptions of low battery and discharged battery conditions, applicable warnings, and recommendations for correcting these conditions if they occur.

Resolving Low Battery Conditions

Condition	Warning	Recommended Action
Low Battery 1	Speaker beeps 6 times. Power/low battery light flashes once a second.	When AC power is available: 1. Connect the AC Adapter to the computer. 2. Continue your work. When a charged battery pack is available and you have an optional Auxiliary Battery installed: 1. Press the standby button. 2. Replace the battery pack within one minute. 3. Press the standby button. 4. Continue your work. If an Auxiliary Battery is not installed or when neither an AC Adapter or a charged battery pack is available: 1. Save your information. 2. Exit the application. 3. Turn off the computer until a power source is available. If Hibernation is enabled, press the **Fn** key + **Standby** button to initiate Hibernation until another power source is available.

Continued

Resolving Low Battery Conditions *Continued*

Condition	Warning	Recommended Action
Low Battery 1 Standby	Speaker beeps six times. The standby light flashes twice a second.	If AC power is available: 1. Connect the AC Adapter to the computer. The computer automatically exits Standby. 2. Continue your work. If AC power is unavailable: 1. Press the standby button to exit standby. 2. Save your information. 3. Exit the application. 4. Turn off the computer until power is available. If Hibernation is enabled, press the **Fn** key + standby button to initiate Hibernation until another power source is available.
Low Battery 2	Speaker beeps 12 times. Power/low battery light flashes twice a second.	Follow the recommendations for Low Battery 1.
Low Battery 2 Standby	Power/low battery light and Standby light flashes 2 times a second until power is lost.	If AC power is available: Connect the AC Adapter to the computer. The computer automatically exits Standby. If AC power is unavailable and Hibernation is enabled, the system initiates Hibernation, saves your information, and turns itself off.

Continued

Resolving Low Battery Conditions *Continued*

Condition	Warning	Recommended Action
Discharged Battery No battery charge remaining.	Lights are turned off and there is no system activity.	Connect the AC Adapter or replace the discharged battery pack with one that is charged.

NOTE: The speaker does not beep if it has been disabled.

TURNING BEEPS ON OR OFF

You can turn warning beeps on or off with one of the following methods:

PWRCON utility You can turn the low battery and standby warning beeps either on or off from a menu by running the PWRCON utility. If you have Windows preinstalled, click on the PWRCON icon in the COMPAQ Utilities group box to access the PRWCON menu.

PWRCON command syntax You can turn the low battery beeps on or off using the command parameters at the system prompt.

SETUP utility You can also turn the low battery and standby warning beeps on or off by running the SETUP utility.

For more information about these utilities, refer to the *EZ Help Online Library*. You can access the online documentation by typing HELP at the system prompt. If you have Microsoft Windows preinstalled, select the help icon.

SPECIAL FEATURES OF THE COMPUTER

This chapter explains how to use some of the special features of your computer such as power conservation, hotkeys and function keys on the keyboard, and MultiLock security.

GETTING THE MOST FROM YOUR BATTERY WITH POWER CONSERVATION

The power conservation (PWRCON) feature lets you take full advantage of the battery power while using it in the most efficient way possible. Power conservation decreases the power consumption of various computer components and turns off others not in use to give you more time to do your tasks. For example, power conservation slows the microprocessor and turns off the hard drive when it isn't being used.

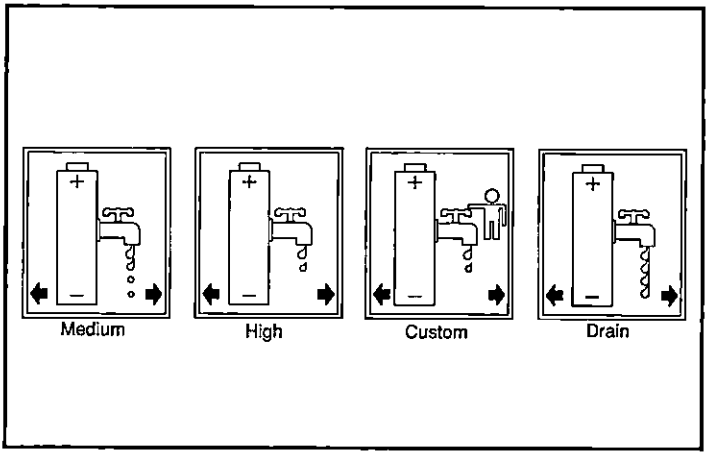
Power conservation works automatically when the computer is operating under battery power. You can select the power conservation level that best suits your current application and operating environment or create your own customized power-management. Initially, the power conservation level is set to medium, the factory-set default, and the computer defaults to that level until you change the setting through the PWRCON or SETUP utility.

Three of the four power conservation levels are preset; you can customize the fourth level using either the SETUP or PWRCON utility. If you have Windows preinstalled, you can access the PWRCON menu by clicking on the PWRCON icon in the COMPAQ Utilities group box.

- Medium–This level is the factory-set default and provides a balance between system performance and battery operating time.
- High–This level conserves the most energy of the three pre-set levels and, as a result, provides the maximum amount of battery operating time.
- Drain–This level turns off power conservation. Use this level when discharging the battery pack.
- Custom–This level allows you to set your own power conservation parameters so that the computer works efficiently with your software applications.

Once you've set your own parameters, the custom level becomes the default.

You can also select a preset level by using the special feature hotkeys, **Fn + F6**, on a popup window as shown below. The popup window displays one level at a time.



Power Conservation Popup Windows

Power Conservation Settings

Power conservation monitors the activity of key computer components, such as the hard drive, processor, display, and keyboard. When a component is inactive for a specific period of time (called a timeout), power conservation reduces the flow of power to that component by shutting it down to conserve battery power until the component is accessed again. The levels of power conservation use a combination of timeouts and values to control a series of components. You can create your own customized power-management level by resetting these timeouts for the components.

The following table shows the components and power conservation level settings:

Power Conservation Settings				
Component	**Medium***	**High**	**Custom**	**Drain**
System Idle timeout	3 min	1 min	1-17 min	0
Standby timeout	10 min	5 min	1-17 min	0
Hard disk drive timeout	2 min	1 min	1-17 min	0
Screen Save timeout	5 min	2 min	1-31 min	0
Display brightness	100%	100%	100%	100%
Processor Speed				
25 MHz 486SL or 386SL	25 MHz	12.5 MHz	25 MHz	25 MHz
20 MHz 386SL	20 MHz	10.0 MHz	20 MHz	20 MHz
*Default setting				

The power conservation levels can be selected or reset in several ways:

Special feature hotkeys Press the **Fn** + **F6** keys to choose a preset level. When the computer is turned off, the default level of power conservation returns.

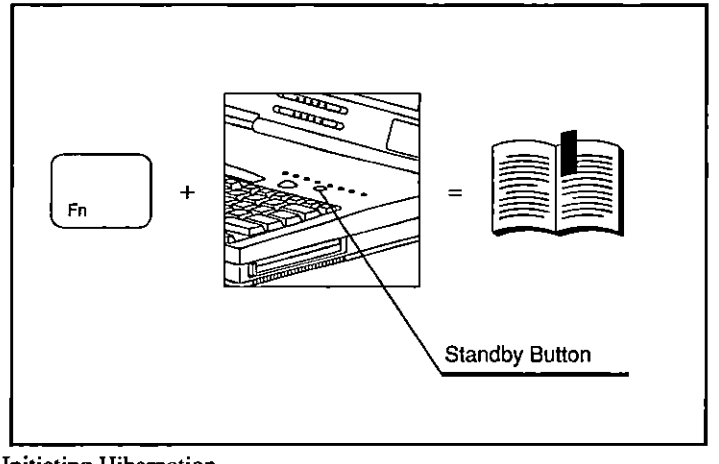
PWRCON utility Run the PWRCON utility to change the power conservation level by using the menu to select a preset level or to customize. To run the utility, enter PWRCON at the system prompt. If you have Windows preinstalled, click on the PWRCON icon in the COMPAQ Utilities group box. Select the option to preset levels. Save your changes and exit the utility.

PWRCON command syntax Customizes the power conservation level by using PWRCON command parameters at the system prompt. Refer to the *EZ Help Online Library* , "User Programs Support Software," for PWRCON command parameters.

SETUP utility Run the SETUP utility to change the power conservation level by selecting a preset level or customizing. Refer to Chapter 5, "Diagnostics and Support Software Utilities and Device Drivers," for procedures on running the SETUP utility.

HIBERNATION

Although Hibernation is turned on through the PWRCON utility, it isn't just another power conservation feature. When Hibernation is turned on, it saves your place in an application and automatically turns off the computer. It allows you to protect your information indefinitely once you allocate the necessary hard disk space. With Hibernation, all information in memory is automatically saved to the hard drive and the computer turns itself off if the battery reaches a critically low condition (Low Battery 2) or is left unattended. Hibernation can also be initiated manually by pressing the **Fn** key + standby button. When the computer is turned on, your information returns at exactly the same place in the application as when the power was initiated–just like a placemark.



Initiating Hibernation

When you turn on the Hibernation feature through the PWRCON utility, it creates a file on the hard drive for information in memory. The hard drive must have space for this file equal to the amount of memory. If there isn't enough storage space on the hard drive to store the information, an insufficient disk space message is displayed and Hibernation will not be enabled.

Turning on Hibernation

To turn on Hibernation, follow these steps:

1. At the system prompt, enter:

   PWRCON

   If you have Windows preinstalled, click on the PWRCON icon in the COMPAQ Utilities group box.

2. Select the option to set Hibernation parameters.
3. Turn on Hibernation.
4. Set the Hibernation timeout.
5. Exit to the main menu.
6. Save your changes and exit the utility.

Initiating Hibernation

Hibernation initiates automatically by the computer system:

- After a specified period of time (timeout) in Standby.
- When the system reaches a critically low battery (Low Battery 2) condition.

You can initiate Hibernation anytime under battery or external power by pressing the **Fn** key + standby button.

When Hibernation is initiated:

- The keyboard locks
- The screen clears
- All current information in memory is saved to the hard drive.
- The computer turns off.

Exiting Hibernation

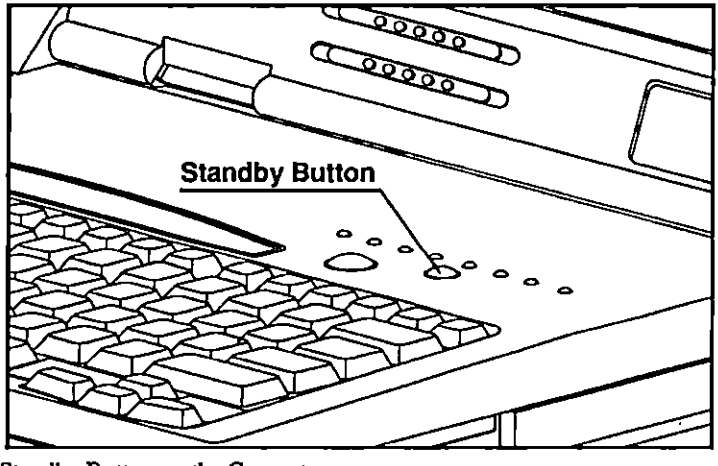
When you turn on the computer:

- The computer exits Hibernation.
- The information saved to the hard disk is returned to the screen at the point where Hibernation was initiated.

NOTE: To stop the restoration of the information, press the **Fn+Ctrl+Break** keys.

STANDBY

As an alternative to Hibernation, Standby saves the place where you left off in your application while conserving battery life. Standby is a reduced power condition during which most of the computer components shut down so that the information in active memory can be retained and battery operating time extended. With a fully charged battery pack, the computer can be left on and in Standby for 24 hours. When the computer exits Standby, your information returns to the screen at exactly the point Standby initiated. More importantly, no information is lost.



Standby Button on the Computer

Initiating Standby

Standby initiates by the computer after:

- 10 minutes (default) of system inactivity during normal operations.
- 20 seconds of inactivity when the system has reached a critically low battery condition (Low Battery 2) and Hibernation is not enabled.

You can initiate Standby at anytime by pressing the standby button on the computer.

When Standby is initiated:

- The screen clears.
- The computer beeps once.
- The standby light begins to blink.
- The power/low battery light turns off.

Exiting Standby

The computer exits Standby when one of the following occurs:

- Pressing the standby button.
- Connecting the AC Adapter or other power source to the computer.
- A call to your modem also causes the computer to exit Standby.
- Replacing the battery pack with one that is fully charged and pressing the standby button.

NOTE: If Standby was initiated by a critically low battery, you must connect the computer to a power source before exiting Standby.

When you exit Standby:

- The computer beeps once.
- Your application returns to the screen
- The standby light turns off.
- The power/low battery light turns on.

At this point, you can continue working where you left off.

SYSTEM IDLE

System Idle is a reduced power condition that the system initiates during short periods of system inactivity before Standby initiates. The default timeout for System Idle is three minutes, while the default timeout for Standby is 10 minutes.

During System Idle, the processor speed slows. Any activity immediately restores the processor speed to its original setting.

IMPORTANT: If you are using an application that uses the processor heavily, the system may initiate System Idle and slow the processing noticeably. If this occurs, use the custom option in the PWRCON utility to set the System Idle timeout to zero.

ADVANCED POWER MANAGEMENT

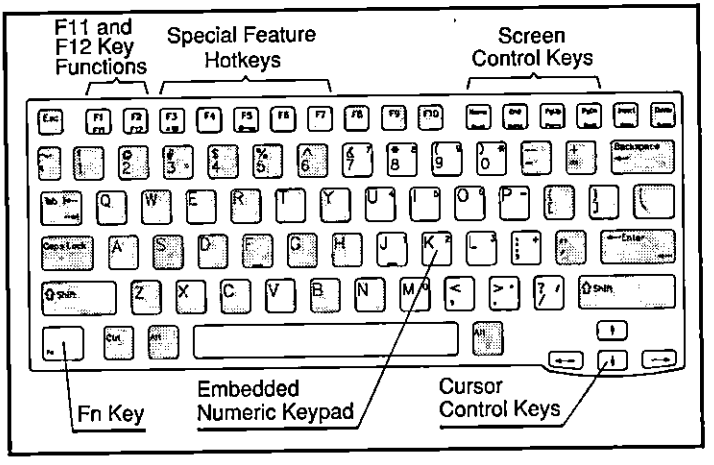
Advanced Power Management (APM), available on selected models, enhances the power conversevation features to reduce power consumption and prolong battery life. APM is a system specification that allows applications, operating systems, and the computer basic input/output system to work together. When communication between the software and hardware is established, applications can send messages to alert the system to conserve power when the application is idle.

You can select an APM operating mode by clicking on the APM icon in the Windows Control Panel. The drop-down menu lets you change power management options and view help information.

USING THE KEYBOARD AND POPUP WINDOWS

The keyboard is fully compatible with the larger 101-/102-key keyboard and provides specific notebook features including special feature hotkeys, **Fn** key, embedded numeric keypad, isolated cursor-control keys, and separate **Home**, **End**, **Pg Up** (page up), **Pg Dn** (page down), **Insert**, and **Delete** keys.

Some key sequences differ slightly on computers with national keyboards.



Keyboard Layout

Fn Key

Use the **Fn** key to access secondary key functions, which are available on those keys with teal colored labels. For example:

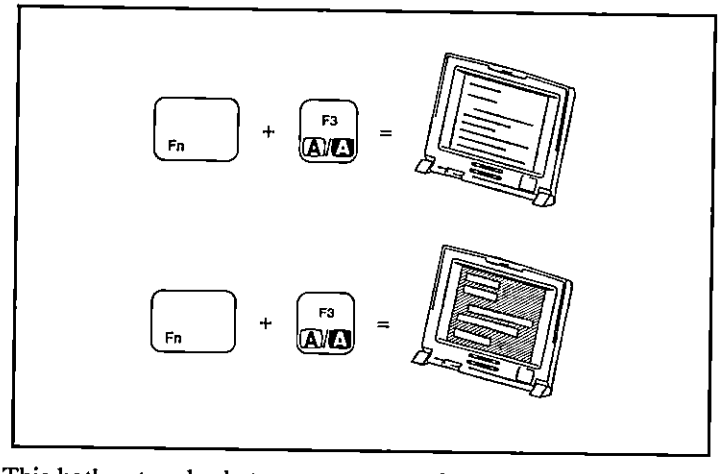
- Press the **Fn** key, then any key from **F3** to **F7** to activate one of the special feature hotkeys.
- Use the **Fn** key in conjunction with the **F1** or **F2** key to activate the **F11** or **F12** key function. Some software applications require F11 and F12 key functions.
- Press the **Fn** + **End** keys to enable the **Num Lk** key (the num lock light comes on) and to activate the embedded numeric keypad.
- Press the **Fn** + the left **Ctrl** keys to produce a right control key function.
- Press the **Fn** + **T** keys to select the Extended Text mode.

The **Fn** key affects other keys only while it is pressed. As soon as it's released, it becomes inactive.

Special Feature Hotkeys

Five hotkey combinations provide special commands in conjunction with the **Fn** key to produce popup windows or software utility functions. Icons on the function keys, **F3** through **F7**, identify these helpful tools. To access hotkey functions, simply press the **Fn** key and the appropriate function key to activate the following functions:

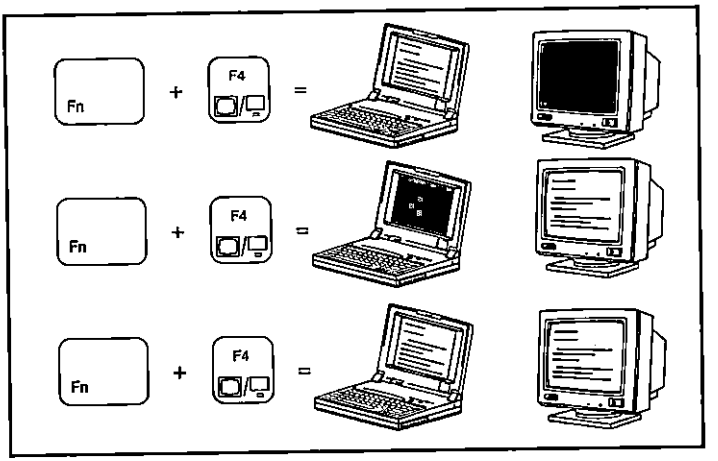
Normal or reverse video (**Fn** + **F3**), which is available on the monochrome displays only.



This hotkey toggles between reverse and normal video, allowing you to view dark text on a light background (normal video), or light text on a dark background (reverse video).

You can also use the key sequence, **Ctrl**+**Alt**+**{ [** (normal video) or **Ctrl**+**Alt**+**}]** (reverse video) to change the display from normal to reverse video. Use the computer keyboard or an external keyboard to activate this feature.

Switching Display (**Fn** + **F4**)



This hotkey allows you to view the computer display or an external display. In addition, on the COMPAQ Contura 3/25c, you can select to view the computer display and an external display simultaneously.

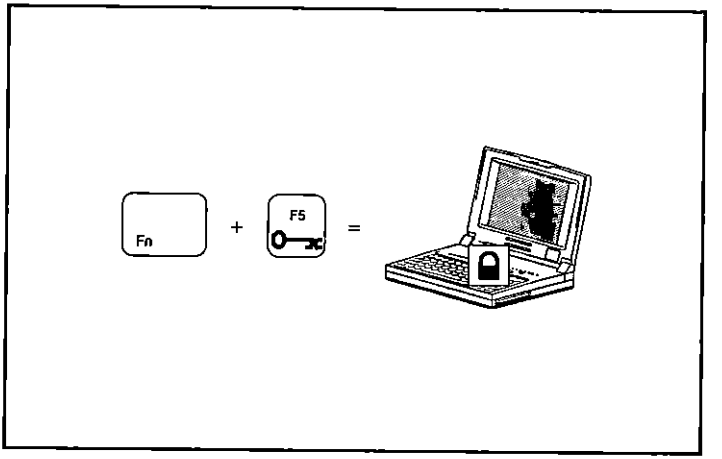
Press the **Fn** + **F4** hotkey to switch from the computer display to an external display, and on the COMPAQ Contura 3/25c, to simultaneous displays.

Also, you can use the key sequences, **Ctrl** + **Alt** + **<** to turn on or off the external monitor and **Ctrl** + **Alt** + **>** to turn on or off the computer display. Using the computer keyboard or an external keyboard, you can perform the following display functions:

- Turn on both displays.*
- Turn off both displays.*
- Turn on the computer display and turn off the external display.
- Turn off the computer display and turn on the external display.

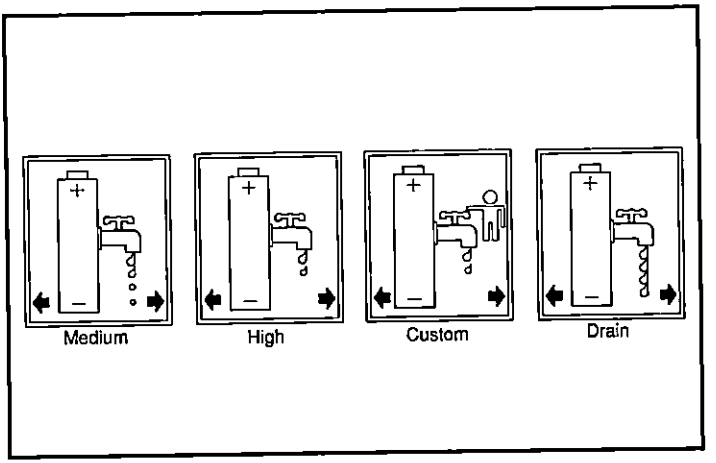
*Supported on the COMPAQ Contura 3/25c personal computers only.

QuickLock/QuickBlank (**Fn** + **F5**)



This hotkey activates the QuickLock/QuickBlank feature that prevents unauthorized access to the computer while you're away from it. While in an application, you can use this hotkey sequence to disable both the keyboard and the keyboard/mouse interface as well as "blank" the screen. However, you must have already set a power-on or keyboard password and enabled the QuickLock/QuickBlank feature through the SETUP utility before it can be activated.

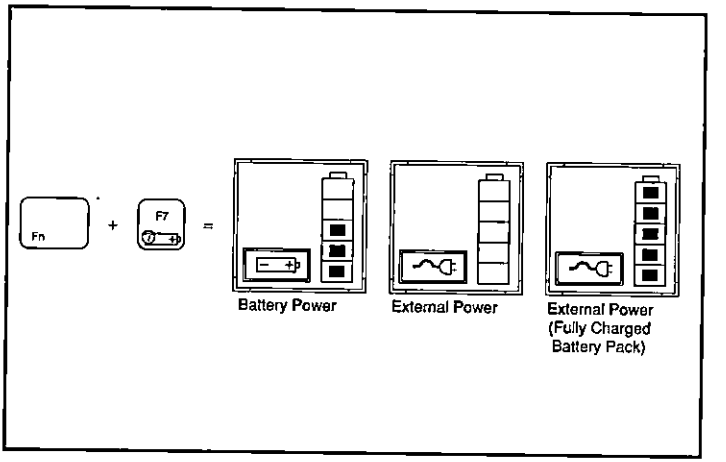
Power Conservation levels (**Fn** + **F6**)



This hotkey displays the power-conservation popup window. Use the arrow keys to choose from three preset levels or a custom level of power conservation. Move from the medium (or default) level of power conservation to either the high, custom, or drain level of conservation. Notice that the popup window changes accordingly.

Repeating the hotkey sequence removes the popup window from the display. The setting you've selected using the hotkeys remains active until you turn off the computer. It then returns to the default setting or the custom level you've set through the PWRCON or SETUP utility.

Battery Gauge (**Fn** + **F7**)



This hotkey displays a battery gauge popup window that shows you approximately how much battery power remains. You'll see how much energy remains in the battery pack. The amount remaining increases or decreases depending on the demands of the application on the various computer components. Under typical operating conditions, the battery gauge is accurate within 20 percent of the amount of energy left in the battery.

Adjusting the Size and Location of Popup Windows

The **F6** and **F7** special feature hotkeys display the power conservation and battery gauge popup windows. You can control the size and screen location of the popup windows through the PWRCON utility. To do so, follow these steps:

1. At the system prompt, enter:

   PWRCON

   If you have Windows preinstalled, click on the PWRCON icon in the COMPAQ Utilities group box.

2. Select the option to size and locate the popup window.
3. Set the size and location of the popup window.

4. When the size and location are the way you want them, select OK.
5. Save the settings.

NOTE: The popup windows can be displayed only on the computer display.

Embedded Numeric Keypad

The embedded numeric keypad consists of 16 keys inside the primary keyboard.

The embedded numeric keypad functions in two ways:

- As part of the normal keyboard operation.
- As a numeric keypad.

The **Fn** + **Shift** keys are used together to activate certain functions within the embedded numeric keypad. These are shown in the following table:

Accessing Embedded Numeric Keypad Functions

When Num Lk is:	*Press:*	*To:*
Off	**Fn** + **End** (**Num Lk**)	Activate the **Num Lk** key, enable the embedded numeric keypad (numbers only), and turn on the num lock light.
On	**Fn** + **End** (**Num Lk**)	Disable the embedded numeric keypad and turn off the num lock light.
On	**Fn***	Temporarily enable keyboard.
On	**Fn** + **Shift***	Temporarily enable the uppercase alphabet on the numeric keypad.
Off	**Fn** + **Shift***	Temporarily enable the numbers on the embedded numeric keypad.

* Press and hold the keys during the entire operation. When the key(s) is released, the keyboard reverts to its original status.

EXTENDED TEXT

Extended Text alters the way text appears on the computer display by allowing the blank areas at the top and bottom of the display to be eliminated. This feature applies only to applications that operate in text mode.

You can select Extended Text in the following modes:

- Text 1, which fills the screen but the size of the characters is unchanged.
- Text 2, which fills the screen but stretches the characters vertically.
- Disabled, which is the default setting, does not fill the screen and the characters remain the standard size.

The Extended Text default value is selected through the SETUP utility. Once you've set the feature to the Text 1, Text 2, or Disabled mode in SETUP, the screen displays that selection every time you turn on the computer.

Pressing the key sequence, **Fn** + **T**, lets you select any of the three settings regardless of the mode you selected in SETUP.

Setting the Extended Text Mode

To set the Extended Text mode through the SETUP utility, follow these steps:

1. Turn on the computer. If it's already on, restart the computer by pressing the **Ctrl** + **Alt** + **Delete** keys.
2. Press the **F10** key as soon as the cursor moves to the upper right-corner of the screen. (This happens almost immediately; the Power-On Self Test [POST] runs, you hear two beeps, then the cursor moves.)

   The System Configuration Summary is displayed.
3. Press the **F4** key to change the configuration.
4. Select the internal display option.

   The Internal Display Options screen is displayed.
5. Select the option to extend the text.

   The options Disabled, Text 1, and Text 2, are displayed.
6. Select the desired Extended Text option, then press the **Enter** key.

7. Press the **Esc** key to return to the System Configuration Summary screen. Verify that the Extended Text option you selected is correct.
8. Press the **F3** key to exit and save your changes.

   The computer automatically restarts.

   NOTE: You can also use this procedure to set Extended Text from the SETUP utility on the Diagnostics diskette.

Using the Key Sequence

The **Fn + T** key sequence is a three-way toggle. Use the keys to toggle from the Disabled, Text 1, or Text 2 setting no matter which mode you selected during SETUP. The key sequence lets you easily disable the feature if you are running an application that uses the full screen, such as 50-line text mode.

USING THE SECURITY FEATURES

Your computer offers multilevel security features that provide solutions for a variety of potential security problems. The following table lists these security features, their purpose, and how to establish them. Detailed instructions on how to set the security features are provided following the table.

MultiLock Security Features

Feature	Purpose	How it is Established
Power-on Password	Prevents use of the computer until the password is entered	SETUP utility
QuickLock/ QuickBlank	Disables the keyboard and keyboard/mouse interface and clears the screen	SETUP or KP (keyboard password) utility
Keyboard Password	Prevents use of the keyboard until the password is entered	KP utility

Continued

MultiLock Security Features *Continued*

Feature	Purpose	How it is Established
Setup Password (available on selected models)	Prevents the use of the SETUP utility until the password is entered	SETUP Utility
Network Server Mode	Permits the computer to operate securely unattended	SETUP Utility
Parallel Interface Control	Prevents transfer of data through parallel interface	SETUP Utility
Serial Interface Control	Prevents transfer of data through the serial interface	SETUP Utility
Diskette Drive Disable (available on selected models)	Disables the diskette drive	SETUP Utility
Asset Management Provision	Records the serial number of the computer	SETUP Utility
Cable Lock Provision	Provides physical security	Hardware

The following provides detailed instructions on how to enable or set the security features.

Power-On Password

By establishing a power-on password, you can prevent anyone without the password from using your computer. When a power-on password is established, it must be entered each time the computer is turned on.

IMPORTANT: You cannot use the computer if you forget your power-on password. Therefore, Compaq recommends that you record your password and put it in a safe place.

To establish a power-on password, follow these steps:

1. Run the SETUP utility.

2. Select the option to set up or change the configuration of the computer. Refer to Chapter 5, "Diagnostics and Support Software Utilities and Device Drivers," for procedures on running the SETUP utility.
3. Press the **F4** key to change the configuration.
4. Select the password control option.
5. Select the power-on password option.
6. Follow the instructions on the screen for establishing the power-on password.
7. Return to the SETUP summary.
8. Select the option to exit the utility.

To enter the power-on password, follow these steps:

1. Turn on the computer.
2. When the power-on password prompt or key symbol ( ) is displayed, enter your power-on password.

If you enter the password incorrectly, a ( ) prompt is displayed. Enter your password again. After three unsuccessful attempts, you must turn the computer off, then on again, before you can continue.

To change the power on-password, follow these steps:

1. Turn on the computer.

   The ( ) is displayed.
2. Enter your current power-on password, type a slash (/), and enter the new power-on password twice as shown:

   current password/new password/new password

IMPORTANT: Type carefully, the characters you type do not appear on the screen.

The new password takes effect the next time you turn on the computer.

To delete the power-on password, follow these steps:

1. Turn on the computer.

   The ( ) is displayed.

2. Enter your current power-on password followed by a slash (/) as shown:

   current password/

If you forget your power-on password, you cannot use the computer until the computer memory is cleared of the password. Clearing memory requires disassembling the computer. Contact your Authorized COMPAQ Reseller for assistance.

Syntax for National Keyboards

The computer keyboard is designed to meet specific country requirements. The syntax required to change or delete the power-on-password vary from one country keyboard to another. When you must change or delete your password, you may need to substitute the slash mark (/) with another key character. Refer to the *EZ Help Online Library* for procedures on substituting the slash mark for your keyboard.

QuickLock/QuickBlank

The QuickLock/QuickBlank feature prevents unauthorized access to the computer until the password is entered. QuickLock disables the keyboard and QuickBlank clears the screen. Both features work from within an application and may be initiated with the **Fn** + **F5** hotkey after a password is established and the feature enabled.

IMPORTANT: Before QuickLock/QuickBlank is initiated, a power-on password or keyboard password must be established and QuickLock/QuickBlank must be enabled using the SETUP or KP utility.

To enable QuickLock/QuickBlank, follow these steps:

1. Run the SETUP utility. Refer to Chapter 5 for procedures on running the SETUP utility.
2. Select the option to change the configuration of the computer.
3. Press the **F4** key to change the configuration.
4. Select the password control option.
5. Select the QuickLock option.

NOTE: If you don't have a password set, you'll be prompted to set one.

6. Follow the instructions on the screen for enabling QuickLock and QuickBlank.

NOTE: You may choose to enable QuickLock without enabling QuickBlank. If you want to enable the QuickBlank feature sometime later, simply run the SETUP utility again.

7. Return to the setup summary.
8. Select the option to exit the utility.

Using QuickLock/QuickBlank

You may activate the QuickLock/QuickBlank feature anywhere in an application by using the hotkey **Fn** + **F5** or you may use the **Ctrl** + **Alt** + **L** (or any letter) key sequence from an external keyboard.

Enter your preset password (power-on or keyboard password) to reactivate the keyboard and return your application to the screen.

Keyboard Password

A keyboard password prevents use of the keyboard until the password is entered or until the computer is turned off.

The keyboard password can be set several ways, depending on whether you've already established a power-on password. You may set the keyboard password in one of the following methods:

Keyboard Password Without a Power-on Password

You do not have to set a power-on password to set a keyboard password. The two passwords can be independent. However, a keyboard password remains in effect only as long as you have the computer turned on, while a power-on password remains in effect until is it changed or deleted.

To set a keyboard password, follow these steps:

1. Go to the system prompt.
2. Type:

   KP
3. Press the **Enter** key.
4. Follow the instructions on the screen to set the keyboard password.

Select a letter or the QuickLock key sequence (**Ctrl** + **Alt** + **L** [L may be any letter]) and whether you want to clear the screen with QuickBlank when the keyboard is disabled.

5. Press the **Enter** key to establish both the keyboard password and **Ctrl** + **Alt** + **L** key sequence, which will be particularly useful from an external keyboard.

NOTE: When you establish the keyboard password, you disable the keyboard.

To reenable the keyboard, type your password and press the **Enter** key.

IMPORTANT: When you turn off the computer, the keyboard password is cleared.

Keyboard Password To Be Same As Power-On Password

If a power-on password is already established, it can be used as the keyboard password. However, you must access the KP (keyboard password) utility and complete the steps described previously to establish the keyboard password.

Keyboard Password Different from Power-On Password

It is also possible to set the keyboard password to something other than the established power-on password. However, the keyboard password reverts to the power-on password when the computer is turned off. This means that the keyboard password can be set only for the current session.

To set a keyboard password that is different from your power-on password, follow these steps:

1. Go to the system prompt.
2. Type:

   KP/C

3. Press the **Enter** key.

Follow the instructions on the screen for setting the keyboard password and the associated **Ctrl** + **Alt** + **L** key sequence.

NOTE: When you press the **Enter** key to establish the keyboard password, you disable the keyboard.

To reenable the keyboard, type your keyboard password and press the **Enter** key.

IMPORTANT: When you turn off the computer, the keyboard password reverts to the power-on password.

Using the Keyboard Password

Once you've set a keyboard password, you can disable the keyboard (or initiate QuickLock/QuickBlank if it is enabled) at any time by simply entering the **Ctrl** + **Alt** key sequence that you specified when you established the password or by using the **Fn** + **F5** hotkeys.

To reenable the keyboard, simply type your keyboard password.

Setup Password

The setup password prevents anyone without the password from running the SETUP utility to modify the setup settings.

To establish a setup password, follow these steps:

1. Run the SETUP utility. Refer to Chapter 5, "Diagnostics and Support Software Utilities and Device Drivers," for procedures on running the SETUP utility.
2. Press the **F4** key to change the configuration.
3. Select the password control option.
4. Select the setup password option.
5. Follow the instructions on the screen for establishing the setup password.
6. Return to the setup summary.
7. Select the option to exit the utility.

Network Server Mode

While in the network server mode, the computer can operate securely as an unattended file server. The feature:

- Disables the keyboard and keyboard/mouse interface.
- Allows the computer to start from the hard drive or remotely from the network server or host computer.
- Restarts the computer automatically after a power outage.

Before the network server mode can be enabled, a power-on password must be established, because the power-on password also functions as the password for the network server mode.

Enabling the Network Server Mode

To enable the network server mode, follow these steps:

1. Run the SETUP utility.
   - If you are running the internal version of SETUP, select the language desired.
   - If you are using the version on the Diagnostics diskette, select the option to set up or change the configuration of the computer.
2. Press the **F4** key to change the configuration.
3. Select the password control option.
4. Select the network server mode option.
5. Select the option to enable the network server mode.
6. Return to the setup summary.
7. Select the option to exit the utility.
8. If you are using the diskette version of the SETUP utility, remove the diskette from the diskette drive.

Serial Interface and Parallel Interface Controls

These features enable and disable the integrated serial and parallel interfaces. Disabling the serial and parallel interfaces prevents data from being transferred through these interfaces. These features are established through the SETUP utility.

Diskette Drive Disable

The diskette drive disable feature is available on selected models of COMPAQ Contura personal computers. This feature enables and disables the read and write operations of the diskette drive. It is established through the SETUP utility.

NOTE: If an error code and message appear after you disable then reenable the diskette drive security feature, restart the computer by turning if off then on.

Asset Management Provision

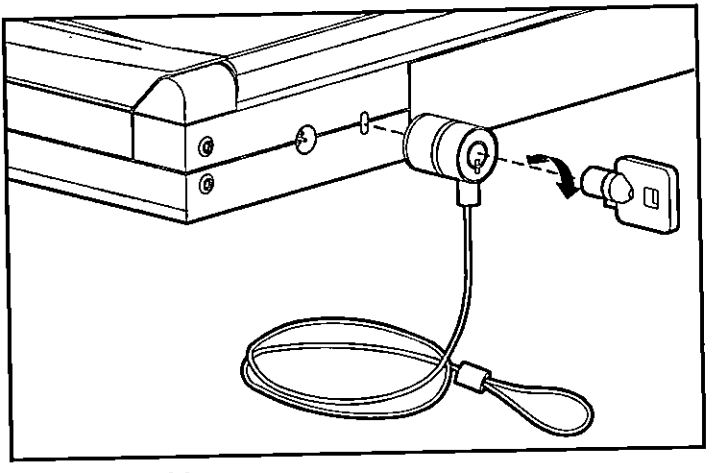
This feature records or holds the serial number of the computer. The serial number is displayed when running the INSPECT or SETUP utility.

Cable Lock Provision

Securing the computer (to a sturdy object, such as a desk) using the cable lock provision prevents unauthorized removal of the computer.

If an attempt is made to remove the computer by force when the cable is locked securely in place, the computer will be damaged. The exterior plastic as well as the sheet metal frame will be visibly altered.

NOTE: You can purchase the cable lock from Kensington Microware Limited or your Authorized COMPAQ Reseller. Ask for the Kensington MicroSaver Security System Model 64068.



Cable Lock Provision

ADDING OPTIONS AND CONNECTING PERIPHERALS

This chapter provides information on installing and connecting optional equipment to the computer. It also includes instructions on how to charge and discharge your battery pack using the Battery Fastcharger/Discharger.

Although COMPAQ notebook computers are designed to be upgraded easily, Compaq strongly recommends that an Authorized COMPAQ Reseller install all optional hardware. An Authorized COMPAQ Reseller can ensure that the option is installed correctly and is functioning properly.

Several specialty options are offered to address your specific needs. The following options are available for the computer:

Coprocessor/Memory

COMPAQ Contura 4/25 Personal Computer

- 16-Megabyte 32-Bit Memory Expansion Board
- 8-Megabyte 32-Bit Memory Expansion Board
- 4-Megabyte 32-Bit Memory Expansion Board

COMPAQ Contura 3/25c, COMPAQ Contura 3/25, and COMPAQ Contura 3/20 Personal Computers

- 387SL Coprocessor
- 8-Megabyte Memory Expansion Board
- 4-Megabyte Memory Expansion Board
- 2-Megabyte Memory Expansion Board

Hard Drives

- 60-Megabyte Hard Drive
- 84-Megabyte Hard Drive
- 120-Megabyte Hard Drive
- 209-Megabyte Hard Drive

Interfaces

- SpeedPAQ 144 Modem
- Enhanced 2400-Baud Internal Modem
- Enhanced 9600-bps Internal Modem (U.S. and Canada only)

- Internal Data + Fax Modem (U.S. and Canada only)
- Serial Interface Board

Conveniences

- External Numeric Keypad
- Enhanced Keyboard
- Enhanced Nickel Cadmium (NiCd) Battery Pack
- Nickel Metal Hydride (NiMH) Battery Pack
- Battery Fastcharger/Discharger
- Enhanced Option Slot Adapter
- Automobile Adapter
- AC Adapter
- Auxiliary Battery

Video

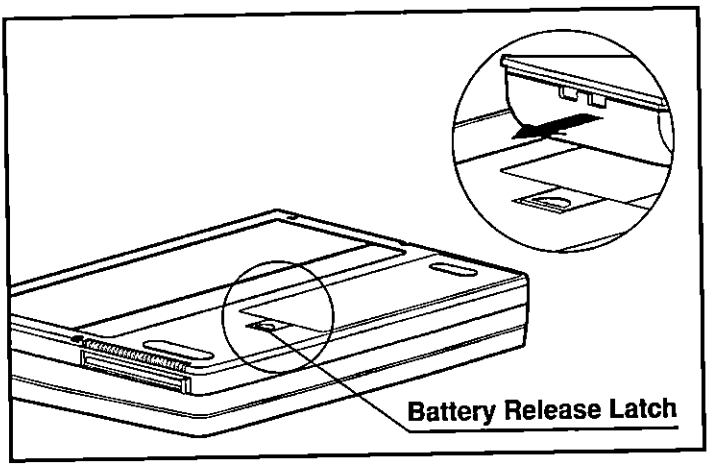
- Video Graphics Color Monitor
- Video Graphics Monochrome Monitor
- Reduced Emissions VGA Color Monitor
- COMPAQ VGA Color Monitor
- COMPAQ SVGA Color Monitor

INSTALLING INTERNAL OPTIONS

To install internal options, the top cover of the unit must be removed to gain access to the inside of the computer. To remove the top cover, follow these steps:

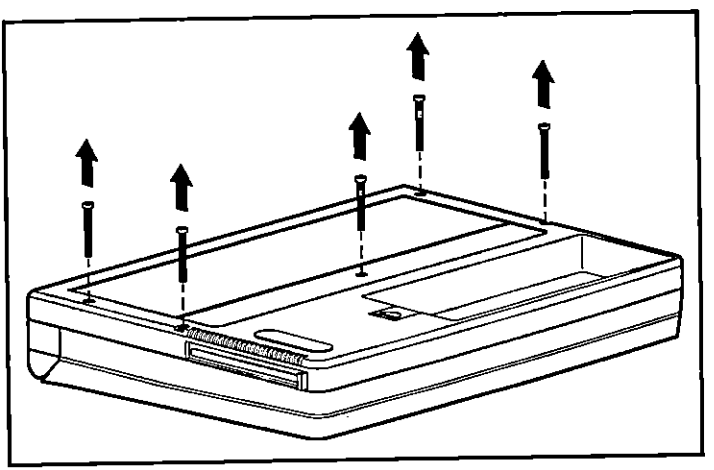
1. Turn off the computer and disconnect the AC Adapter from the AC outlet, then from the computer.
2. If connected, disconnect all external devices.
3. Turn over the computer, bottom side up.

4. Remove the battery pack by moving the battery release latch to the left. The battery pack springs up.



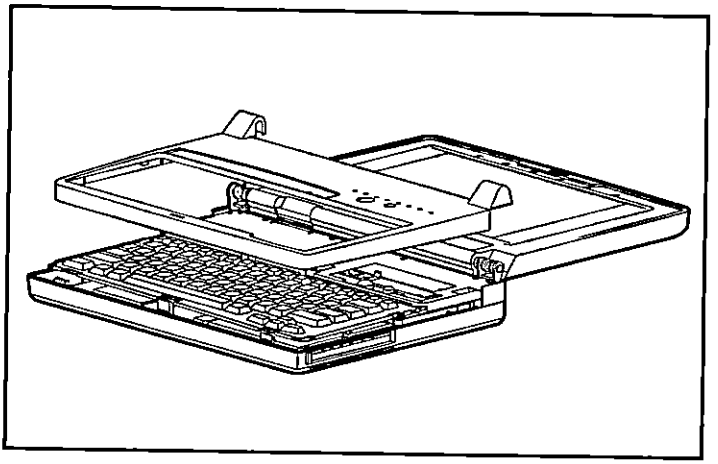
Removing the Battery Pack

5. Using a Phillips P-1 screwdriver, remove the five screws on the bottom of the unit.



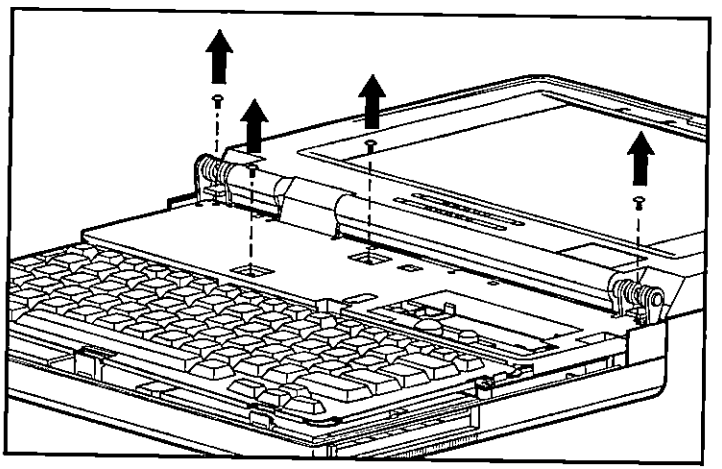
Removing the Bottom Cover Screws

6. Turn over the computer, top side up.
7. Remove the top cover of the computer.



Removing the Top Cover

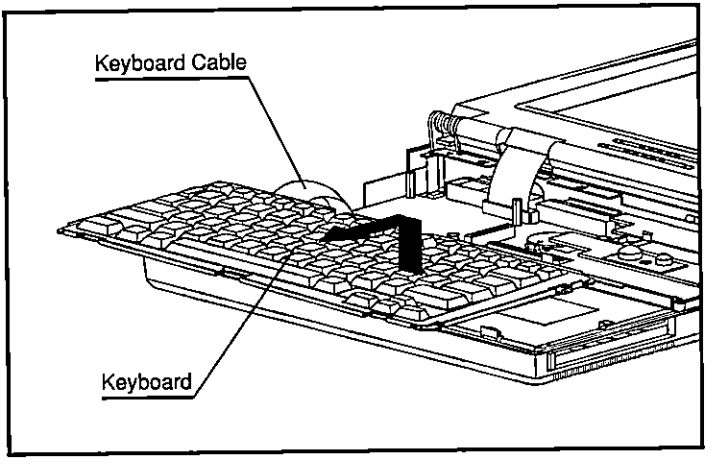
8. Using a Phillips P-1 screwdriver, remove the four screws securing the system chassis cover. Remove the system chassis cover.



Removing Screws from the System Chassis Cover

9. If you are installing a coprocessor, remove the keyboard by lifting it up from the front end and sliding it forward toward you.

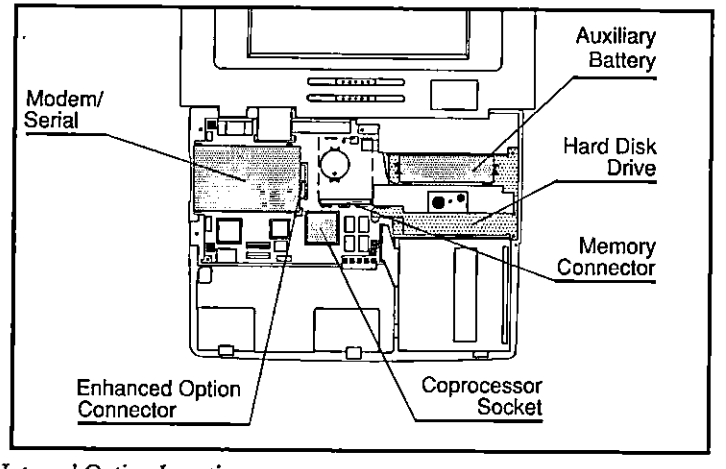
   It is not necessary to disconnect the keyboard cable from the system board.



Lifting the Keyboard

You are ready to install your option. Refer to the documentation accompanying the option for detailed installation procedures.

Use the following illustration to identify the internal components when installing internal options.



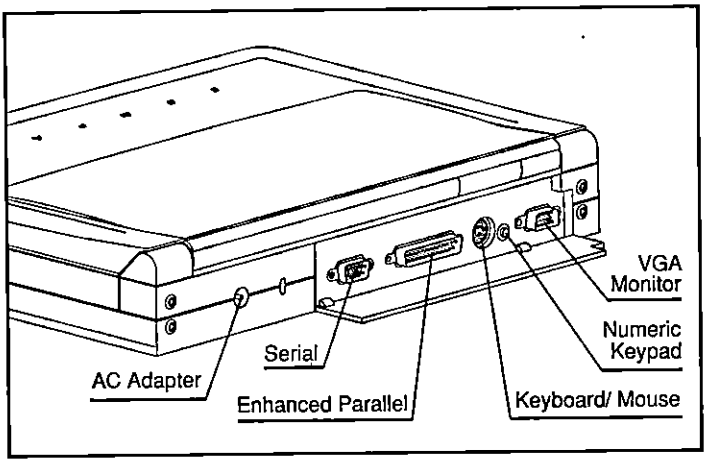
Internal Option Locations

NOTE: Once you've installed your option(s), you need to run the SETUP utility. Refer to Chapter 5, "Diagnostics and Support Software Utilities and Device Drivers," for instructions on running SETUP.

10. To reassemble the computer, reverse the previous steps.

EXTERNAL CONNECTORS

The external connectors are located on the back of the computer.



External Connectors

IMPORTANT: In addition to the following procedures in this guide, consult the documentation accompanying the optional equipment you are connecting for more detailed instructions.

Connecting the AC Adapter

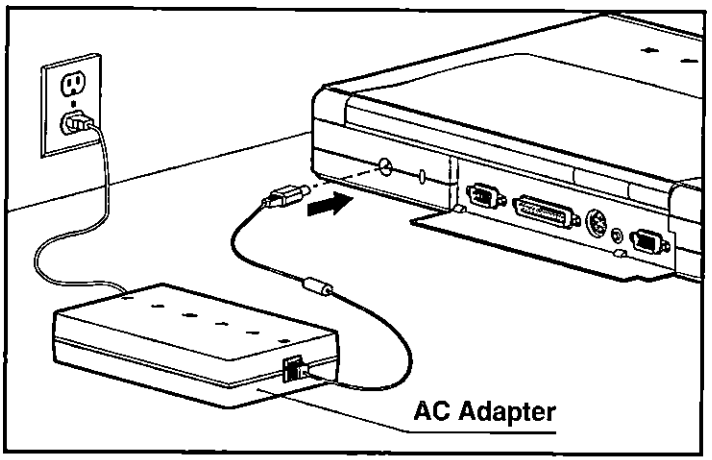
To connect the AC Adapter (included with your computer), follow these steps:

> **WARNING:** This equipment is designed for connection to a grounded (earth) outlet. The grounding type plug is an important safety feature. To avoid risk of electric shock or damage to the equipment, do not disable this feature.

1. Connect the AC power cord to the AC Adapter.
2. Plug the AC power cord into a grounded AC outlet that is easily accessible and located as near to the computer as possible.
3. Connect the AC Adapter cable to the AC Adapter connector on the rear of the computer.

4. Turn on the computer, if it's not already on.

NOTE: You can change from battery power to the AC Adapter without turning off the computer or losing data by completing the previous steps.



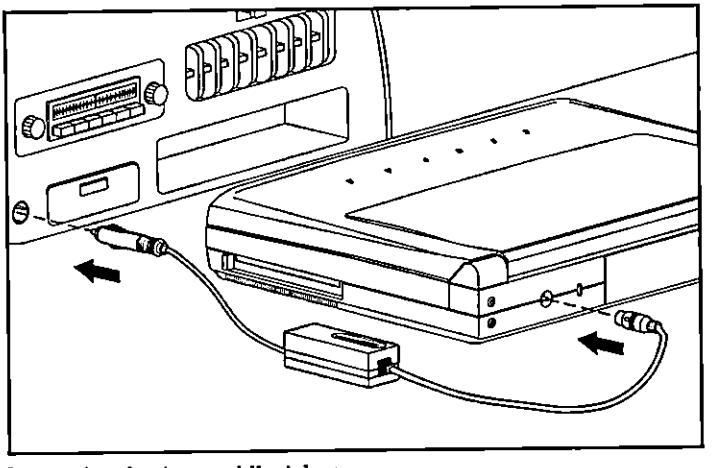
Connecting the AC Adapter

Connecting the Automobile Adapter

To connect the Automobile Adapter to the computer, follow these steps:

1. Turn on the vehicle engine.
2. Plug the Automobile Adapter cable into the vehicle cigarette lighter socket.

3. Insert the other end of the Automobile Adapter cable into the AC Adapter connector on the rear.
4. If it's not already on, turn on the computer.



Connecting the Automobile Adapter

NOTE: You can also connect the Automobile Adapter to a Battery Fastcharger/Discharger and fast charge up to two battery packs while you're on the road.

Connecting and Using the Battery Fastcharger/Discharger

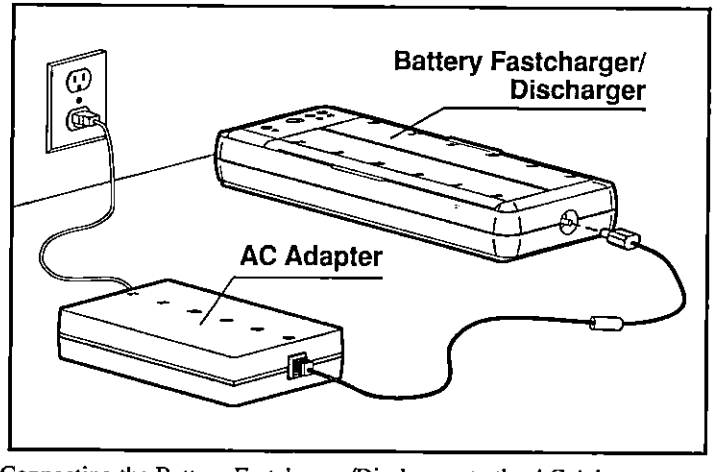
The Battery Fastcharger/Discharger allows you to fast charge up to two battery packs sequentially. The battery charger may be powered by either the AC Adapter or the Automobile Adapter.

Connecting the Battery Fastcharger/Discharger to the AC Adapter

To connect the Battery Fastcharger/Discharger to the AC Adapter, follow these steps:

> **WARNING:** This equipment is designed for connection to a grounded (earth) outlet. The grounding type plug is an important safety feature. To avoid risk of electric shock or damage to the equipment, do not disable this feature.

1. Insert the AC Adapter cable into the Battery Fastcharger/Discharger.
2. Connect the AC power cord to the AC Adapter.
3. Plug the free end of the power cord into a grounded AC outlet that is easily accessible and located as near to the computer as possible.

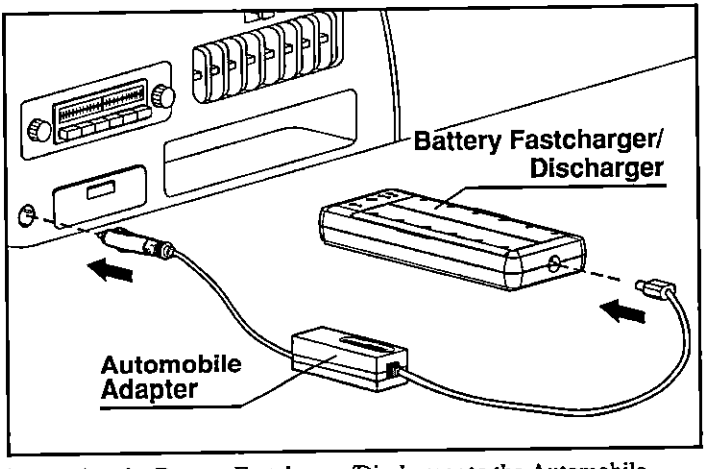


Connecting the Battery Fastcharger/Discharger to the AC Adapter

Connecting the Battery Fastcharger/Discharger to the Automobile Adapter

To connect the Battery Fastcharger/Discharger to the Automobile Adapter, follow these steps:

1. Turn on the vehicle engine.
2. Plug the Automobile Adapter cable into the vehicle cigarette lighter socket.
3. Insert the Automobile Adapter cable into the Battery Fastcharger/Discharger.



Connecting the Battery Fastcharger/Discharger to the Automobile Adapter

Inserting a Battery Pack into the Battery Fastcharger/Discharger

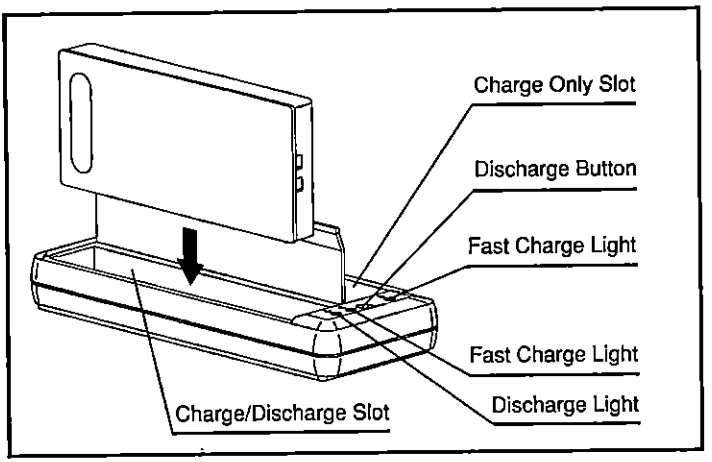
To insert and charge a battery pack in the Battery Fastcharger/Discharger, follow these steps:

1. Lift one of the charging slot covers on the Battery Fastcharger/Discharger.
2. Insert the battery pack into the charging slot (either slot will charge the battery pack).

If the battery pack is inserted correctly and is within normal operating temperature and voltage, the green fast charge light on the battery charger turns on and stays on until the battery pack is fully charged. Refer to the section on "Storing the Battery Pack" in Chapter 2.

If the battery pack is already fully charged, the light turns on momentarily, then turns off. If the battery pack is defective, the green fast charge light on the Battery Fastcharger/Discharger flashes until the battery pack is removed.

NOTE: You can insert a second battery pack into the empty charging slot. The battery pack with the most charge remaining charges first and its corresponding fast charge light turns on. When the charge is complete, the other battery pack begins a fast charge and its corresponding fast charge light turns on.



Inserting a Battery Pack Into the Battery Fastcharger/Discharger

To discharge the battery pack, follow these steps:

1. If you are using an Automobile Adapter, turn on the vehicle engine.
2. Plug the power cord/cable into the external power source.
3. Plug the AC Adapter cable or the Automobile Adapter cable into the Battery Fastcharger/Discharger.
4. Lift the charge/discharge slot cover on the Battery Fastcharger /Discharger.
5. Insert the battery pack into the slot.
6. Press the discharge button on the Battery Fastcharger/ Discharger.

The yellow discharge light turns on. When the battery pack is fully discharged, the discharge light turns off. Then, a fast charge begins and the green fast charge light turns on and stays on until the battery pack is fully charged.

NOTE: To end discharging at anytime, press the discharge button or remove the battery pack from the charge/discharge slot.

Connecting the External Numeric Keypad

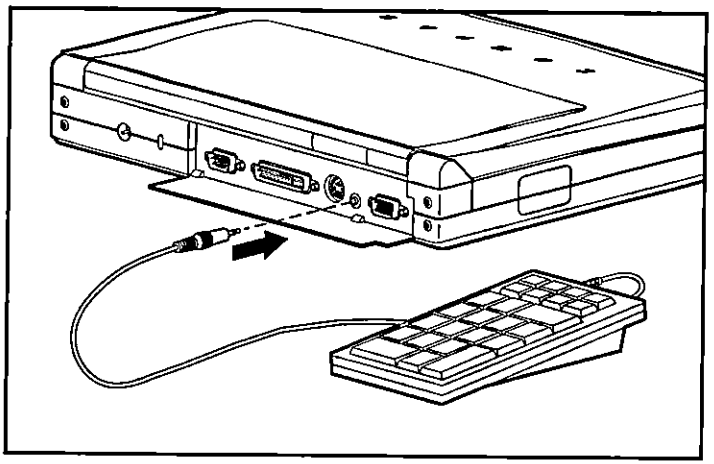
To connect the External Numeric Keypad, follow these steps:

> **CAUTION:** To prevent damage to the computer, turn off the computer before connecting or disconnecting the External Numeric Keypad.

1. Turn off the computer.
2. Open the connector cover on the back of the computer.
3. Connect the numeric keypad cable to the numeric keypad connector on the computer.
4. Turn on the computer.

   The embedded numeric keypad in the computer keyboard is disabled.
5. Press the **Fn** + **End** (**Num Lk**) keys to activate the numeric keypad.

   The num lock light on the computer turns on.



Connecting the External Numeric Keypad

Connecting an External Keyboard

Either an External Enhanced Keyboard, a mouse, or trackball (or other pointing device) can be connected to the keyboard/mouse connector on the rear of the computer.

To connect an external keyboard, follow these steps:

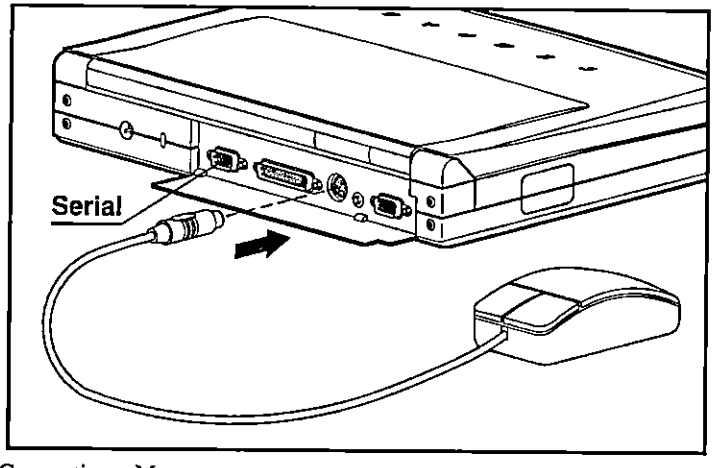
1. Turn off the computer.
2. Open the connector cover on the rear of the computer.
3. Connect the keyboard cable to the keyboard/mouse connector on the computer.
4. Turn on the computer

Connecting a Mouse

To connect a mouse, follow these steps:

1. Turn off the computer.
2. Open the connector cover on the back of the computer.
3. Connect a PS/2 mouse to the keyboard/mouse connector.

NOTE: You can connect a serial mouse, which has a D-shaped 9-pin connector, to the serial connector on the back of the computer or, if a serial interface board is installed, to the serial board.



Connecting a Mouse

4. Turn on the computer.

Installing the Mouse Software

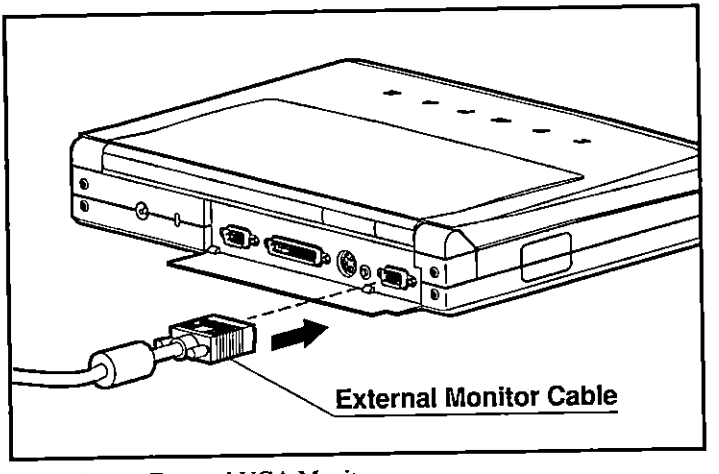
The mouse needs a software device driver for it to operate. The driver comes on a diskette included with the mouse when you purchase it. Consult the documentation accompanying the mouse for instructions on installing the driver and configuring the computer.

Connecting an External VGA Monitor

To connect an external VGA monitor, follow these steps:

1. Turn off the external monitor if the switch is set to on.
2. Turn off the computer.
3. Open the connector cover on the back of the computer.
4. Plug the monitor signal cable into the VGA monitor connector on the rear of the computer.
5. Plug the monitor power cord into a grounded AC outlet.
6. Turn on the external monitor.
7. Turn on the computer.

NOTE: Toggle the **Fn** + **F4** hotkeys to switch between the computer display and the external monitor. On the COMPAQ Contura 3/25c, the **Fn** + **F4** hotkeys also let you switch to both the computer display and external monitor simultaneously. Refer to Chapter 3, "Special Features of the Computer," for more information on the hotkeys.



Connecting an External VGA Monitor

Connecting a Printer

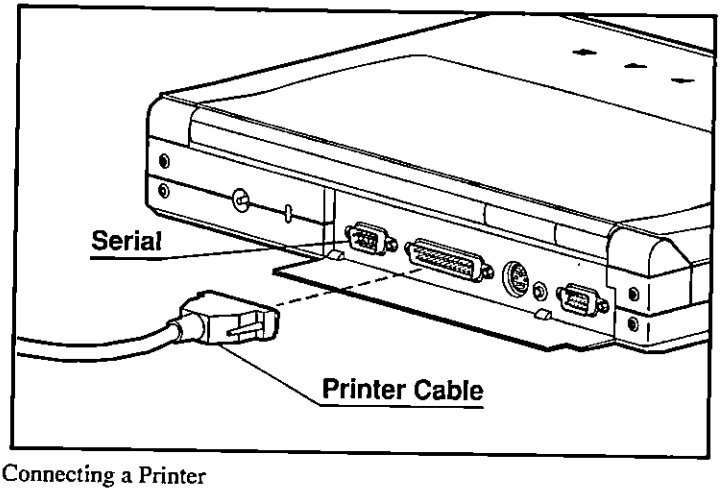
The way a printer is connected depends on the way it receives information: through either a parallel interface or a serial interface. (An interface is an information interchange path through which the computer and an external device communicate or interact). Most printers have a parallel interface, however, some printers use either method of receiving information.

To connect a printer, follow these steps:

1. Turn off the computer.
2. Plug the printer-end of the printer signal cable into the printer. (You can visually determine which connector plugs into the printer by choosing the one that matches the connector on the printer.)
3. Open the connector cover on the back of the computer.

4. Depending on the type of printer you are connecting, plug the printer signal cable into either the parallel connector or the serial connector on the back of the computer. (A connector adapter may be required to connect a serial printer.)

NOTE: The following illustration shows a parallel printer signal cable being plugged into the parallel connector.



Connecting a Printer

5. Plug the printer power cord into a grounded AC outlet.

IMPORTANT: To ensure that the computer system recognizes the printer, turn on the printer before you turn on the computer.

6. Turn on the printer.

7. Turn on the computer.

Setting the Printer Configuration Switches

Some printers have internal switches for certain operating modes. The factory (default) switch settings are standard for most situations and may not need to be changed. Consult the documentation accompanying the printer to see if it contains internal switches and if you need to change the default settings to satisfy your printer requirements.

Choosing Printer Support Through Application Software

Your application software comes with software device drivers for many kinds of printers. You must choose your printer, special printer capabilities, and connection (such as LPT for parallel printers or COM for serial printers) through your applications for the printer to operate. To support your particular printer, consult both your printer and software applications documentation.

DIAGNOSTICS AND SUPPORT SOFTWARE UTILITIES AND DEVICE DRIVERS

This chapter explains how to use the utilities in Diagnostics and describes the support software utilities and device drivers.

DIAGNOSTICS

The SETUP, TEST, and INSPECT utilities in Diagnostics verify the proper operation of the computer, allow you to set custom features, and aid in troubleshooting. Diagnostics is installed on the computer and is also provided on diskette included with your documentation.

SETUP UTILITY

The computer uses a battery-powered memory device to store the current date and time and the system configuration. The configuration usually includes information about the available memory, the microprocessor, the type and size of the mass storage devices, as well as similar information about other hardware that may be installed. The SETUP utility enters this information into that memory device.

You should run the SETUP utility in the following instances:

- To establish security controls.
- To set power conservation parameters.
- To set system configuration features, including:
  - Parallel interface control
  - Serial interface control
- To change the system configuration, which is necessary when you add or remove optional hardware.
- To change default (factory) settings for many computer features.
- When a system configuration error is detected during the Power-on Self Test (POST).

TEST Utility

The TEST utility determines if the various computer components installed are recognized by the system and functioning properly. Running TEST is optional but advisable after installing or connecting a new device.

INSPECT Utility

The INSPECT utility provides information about the system once it has been configured. INSPECT operates with MS-DOS. It provides information about the system operating environment including:

- Contents of the operating system startup files
- Current memory configuration
- ROM version installed
- Type of processor and coprocessor
- Diskette and hard drives installed
- Active printer and/or communications interfaces
- Modem installed

You can use the INSPECT utility to display, print, or save this information. Your Authorized COMPAQ Reseller may ask you to run this utility to assist in analyzing the system. This information allows the Authorized COMPAQ Reseller to reproduce the same environment on another computer for testing.

Before Using Diagnostics

Use the AC Adapter with the computer during the SETUP or TEST procedures rather than battery power. A low battery condition could initiate Standby and interrupt the program.

You have the option of setting several security features, including special passwords when running the SETUP utility. Before you choose to do so, you may want to review Chapter 3, "Special Features of the Computer," for more information on the password feature. It is also possible to change power conservation parameters through the SETUP utility. Before making any changes, refer to Chapter 3 on power conservation for a review of the power conservation features.

Running the SETUP Utility

You have two ways to run the SETUP utility.

- **Internal SETUP** This method is installed on the computer. The menu selections and SETUP options are straightforward. This SETUP version does not contain the on-screen help that may be needed by the beginner user.
- **Diagnostics Diskette** This method uses the Diagnostics diskette that came with your documentation. This SETUP version contains help screens and is recommended for someone new to the computer.

Running Internal SETUP

To run the internal SETUP utility, complete the following steps:

1. Turn on the computer.
2. Press the **F10** key as soon as the cursor moves to the upper-right corner of the screen. (This happens almost immediately–the Power-On Self-Test [POST] runs, you hear two beeps, then the cursor moves.)
3. Select the language desired–English, German, Italian, Spanish, French.

   The System Configuration Summary is displayed.
4. Press the **F4** key to change the configuration.

   NOTE: You cannot enable the Hibernation feature by using the internal version of SETUP. It can be done only through SETUP on the Diagnostics diskette.
5. Select the option you want to set or change.

   A Change Configuration list is displayed.
6. Follow the instructions on the screen.
7. Return to the System Configuration Summary.
8. Press the **F3** key to exit from the utility and save your changes.

Running SETUP from the Diskette

To run the SETUP utility from the diskette, complete the following steps:

1. Turn on any external devices that have power switches.
2. Insert the Diagnostics diskette into the diskette drive.
3. Turn on the computer. If it is already on, restart the system by pressing the **Ctrl+Alt+Delete** keys.

   The green power light on the computer turns on.

   The system runs the Power-On Self-Test (POST), counting then displaying the amount of memory and checking the various system components.

   NOTE: POST does not run after a system restart.

   If an error message is displayed, refer to Appendix B for an explanation of the message and the action recommended to resolve it.

   The Diagnostics menu is displayed.
4. Select the option from the menu to set up or change the configuration of the computer.

   A setup summary of the system configuration is displayed.

   NOTE: The SETUP utility does not recognize tape drives and some non-COMPAQ options.
5. If you need to change an incorrect setting in the system configuration, press the **F4** key.

   Select the item you want to change, follow the instructions on the screen; then return to the setup summary screen.
6. When the configuration is correct, press the **F3** key to exit and return to the Diagnostics menu.
7. If you are planning to run the TEST program:

   a. Select the option to test or inspect the computer.

   b. Go to step 8 in the following section, "Running the TEST Utility."

   If you are not planning to run the TEST utility, select the option that allows you to exit the utility.

When the exit message is displayed:

a. Remove the Diagnostics diskette from the diskette drive.

b. Press the **Enter** key to restart the computer.

Running the TEST Utility

When you run the TEST utility, be sure to record the error message numbers; then contact your Authorized COMPAQ Reseller for assistance.

To run the TEST utility, complete the following steps:

1. Turn on any external devices that you wish to test.
2. Insert the Diagnostic diskette into the diskette drive.
3. Turn on the computer or restart it by pressing the **Ctrl+Alt +Delete** keys.
4. Select the option to test or inspect the computer from the menu.
5. Select the option to test the computer.

   A test option menu is displayed.
6. Select the option to view the device list.

   A list of the hardware devices that are installed in the system is displayed.
7. Verify that the TEST utility correctly detected the devices installed:

   NOTE: This utility does not detect all non-COMPAQ options.

   - If the list is correct, select OK and go on to step 8.

     The test option menu is displayed again.
   - If the list is incorrect, be sure that any new devices are installed properly. If you do not find an installation problem, call your Authorized COMPAQ Reseller.

8. Select one of the following from the test option menu:

   - **Quick Check Diagnostics** This option runs a quick, general test on each device with a minimal number of prompts. If errors occur, they are displayed when the testing is complete.
   - **Automatic Diagnostics** This option runs an unattended, maximum testing of each device with minimal prompts. You can choose how many times to run the tests, to stop on errors, or to print or file a log of errors.
   - **Prompted Diagnostics** This option allows maximum control over the device testing process. You can choose attended or unattended testing, decide to stop on errors, or choose to print or file a log of errors.

9. Follow the instructions on the screen as the diagnostic tests are run on the devices.

   When the testing is complete, the test option menu is displayed again.

10. Exit to the Diagnostics menu, then exit the utility.

    When the exit message is displayed, remove the Diagnostics diskette and press the **Enter** key to restart the computer.

Running the INSPECT Utility

To run INSPECT, complete the following steps:

1. Insert the Diagnostics diskette into the diskette drive.
2. Turn on the computer.

   The Diagnostics menu is displayed.

3. Select the option to test or inspect the computer.

   The test or inspect computer menu is displayed.

4. Select the option to inspect the computer.

   Operating environment information is displayed.

5. Scroll through the information.
6. Print or file the information.
7. Remove the diskette immediately after you press the keys to restart the computer. If you don't remove the diskette, the computer will restart from the Diagnostics diskette.

SUPPORT SOFTWARE UTILITIES AND DEVICE DRIVERS

The COMPAQ software utilities and device drivers help you get the best possible performance from your computer. Refer to the *EZ Help Online Library* by entering HELP at the system prompt or selecting the help icon for detailed information on how to use these utilities. This section provides a general description and overview of the software utilities and device drivers that are preinstalled on your computer.

Memory

Memory utilities and drivers are perhaps the most useful of all the utilities in your computer. Refer to the section on "Maximizing System Memory" in this chapter for information that may be helpful to you when using memory support software.

Memory Support Software

Utility	Description
CACHE	Disk CACHE decreases the time it takes for applications to access data from the hard drive.
EXMEM	Provides Expanded Memory Specification (EMS) and eXtended Memory Specification (XMS) memory management on 386SL-based COMPAQ Contura Personal Computers while operating in real mode allowing MS-DOS applications to use more memory. Provides XMS memory management on 486SL-based COMPAQ Contura Personal Computers.
RUNHI	Lets you load and run device drivers and terminate-and-stay-resident programs in memory between 640 and 1024 Kbytes, freeing base memory.
VDISK	Creates a drive in memory (a virtual disk) for quicker data access.

Continued

Memory Support Software *Continued*

Utility	Description
CEMM	Lets you extend the 640-Kbyte memory level imposed by MS-DOS and provides EMS that allows MS-DOS applications to use more memory.
HIMEM	Manages extended memory by implementing eXtended Memory Specifications (XMS).

For additional information on these utilities, refer to the *EZ Help Online Library.*

Display

With the display utilities and device drivers, you can change the way your screen displays text and use the screen save feature to extend the life of your screen.

Display Software Support	
Utility	**Description**
ADAPT	Allows you to customize the display attributes of your screen to make text more readable and change the size of the cursor.
Screen Save	Lets you set the number of minutes of keyboard and mouse timeout before the screen goes blank. This feature is established through the PWRCON utility or ADAPT.

Keyboard

With keyboard utilities, you can install a password, use a keyboard driver and use an optional Enhanced Keyboard.

Keyboard Software Support

Utility	Description
KEYB	Loads the keyboard driver that lets you use a keyboard other than the one for the U.S. English.
KP	Lets you install a keyboard password that locks your keyboard to prevent unauthorized use of your system.

Windows Device Drivers

Windows device drivers allow certain applications to take advantage of the integrated video graphics system. Graphics operations, such as menu scrolling, pop-up menus, and pull-down menus show improved performance with these COMPAQ drivers. These utilities are designed to enhance the way Microsoft Windows, which is preinstalled in some models, performs on your system.

Microsoft Windows Software Support

Utility	Description
VHIBERD.386	A virtual hibernation driver, which ensures that Windows has the correct date and time after the Hibernation feature is initiated. This driver monitors the system timer used by Windows and updates it when necessary to match the real-time clock in your computer. This driver is established through the CPQSETUP program.
Video Device Drivers	Supports graphics display and color by enhancing pixel resolutions beyond the VGA standard for Windows environment. The video device drivers are established through the CPQSETUP program.

Continued

Microsoft Windows Support Software *Continued*

Utility	Description
Fastdisk Drivers	Provides improved disk performance and ensures proper spin-up and spin-down of the hard drive for power conservation.

Using the CPQSETUP Program

The CPQSETUP program automatically installs the virtual hibernation driver and video device drivers on your computer. Use the CPQSETUP program to create the *OEMSETUP.INF* file, which is necessary for Microsoft Windows to run properly.

To use the CPQSETUP program, follow these steps:

1. At the system prompt, enter

   CD DISPLAY

2. Enter

   CPQSETUP

   You are given the choice of having CPQSETUP install drivers for you, reconfiguring existing drivers, or creating the *OEMSETUP.INF* file. If you choose the last option, CPQSETUP determines which graphics controller you have, creates an appropriate *OEMSETUP.INF* file, and returns you to the DOS prompt.

   CPQSETUP detects which graphics controller you have in your system and displays the driver configuration options available. In each case, default settings are highlighted.

3. Select to Continue.

   NOTE: If you want to select options other than those highlighted, use the arrow keys to highlight the options and press the **Enter** key or if you are using a mouse, click on the desired options.

   CPQSETUP attempts to find the current Microsoft Windows Version directory. The directory selected is displayed.

4. Select to continue if the display directory is the one in which you want graphics drivers to be installed. Otherwise, type in the name of the directory containing the Microsoft Windows version files.

CPQSETUP installs the driver files you selected and modifies your *SYSTEM.INI* file to reflect the configuration options chosen. It also copies and installs the appropriate font files for the resolution and resource options you chose.

If you have Microsoft Windows already installed, use the following procedures for using CPQSETUP program to create the *OEMSETUP.INF* file.

1. At the system prompt, enter

   ```
   CD DISPLAY
   ```

2. Enter

   ```
   CPQSETUP
   ```

   You are given the choice of having CPQSETUP install drivers for you, reconfiguring existing drivers, or creating the *OEMSETUP.INF* file.

3. Choose the option to create the *OEMSETUP.INF* file.

   CPQSETUP creates the *OEMSETUP.INF* and other files needed by the Microsoft Windows. It does not install the driver.

4. Follow the Microsoft Windows directions for starting the SETUP utility.

   The system information screen displays the computer type, display adapter, mouse, and keyboard.

5. Use the arrow keys to highlight the display adapter line, and press the **Enter** key.

   A list of display drivers is displayed.

6. Select other and press the **Enter** key.

   You are prompted to insert a diskette into diskette drive and enter the path for the device driver files.

7. Insert the User Programs Windows for Microsoft Windows into the diskette drive.

8. Enter

   ```
   A:\DISPLAY
   ```

   Depending on your system, one or more driver choices are displayed.

9. Select the driver you want to use and press the **Enter** key to continue with the driver installation.

10. Press the **Enter** key to accept the configuration shown.

Cursor Enhancement

The mouse/trackball driver, which is installed on COMPAQ Contura models with preinstalled Microsoft Windows, includes a cursor enhancement parameter. This parameter lets you select the size, speed, and shape of the cursor by clicking on the mouse/trackball icon from the Windows Control Panel.

Other Support Software

The following utilities also enhances the performance of your computer.

Other Support Software

Utility	Description
PWRCON	Lets you change the power conservation level by selecting a preset level or customizing the level using the power conservation menu.
POWER.EXE	Reduces the power consumption when applications and system devices are idle. This driver conforms to the Advanced Power Management (APM) specifications that is available on selected models.

CONFIGURING MEMORY FOR YOUR APPLICATION

Before you can configure memory for an application, you should first have some understanding of the basic types of memory and how memory is used by the computer.

System memory falls into two categories:

- Read-only memory (ROM)
- Random-access memory (RAM)

ROM

A ROM chip is non-volatile or permanent, meaning that the information stored in ROM cannot be lost when you turn off the computer.

A program that is stored in ROM is frequently referred to as firmware because the program cannot be changed once the chip is installed in your computer. Remember, it's read-only memory.

ROM is used to store programs and data that never change, like information specific to the computer hardware. For example, BIOS (Basic Input/Output System) and the Power-On Self-Test (POST) are often stored in ROM.

RAM

Unlike ROM, data can be written into as well as read from each RAM storage location. RAM storage is also volatile; information is not retained when the computer is turned off, that is, unless it is saved to storage media (diskette, hard drive, or tape).

RAM is the area the computer uses to run applications. For example, when you want to run a word processing program, it is read off the disk, placed into RAM, and executed.

The contents of RAM are not permanent and are lost when you turn off the computer, unless you save the information to a storage media.

Base Memory

Base memory, or conventional DOS memory, is memory located between 0 and 640 Kbytes. MS-DOS uses some of this memory to operate and the rest to run MS-DOS applications.

Upper Memory Area

The Upper Memory Area ranges from 640 to 1024 Kbytes. System hardware, such as video buffers and system ROM, use upper memory.

Since the need to run several programs simultaneously has increased, hardware devices and software utilities have been created that allow MS-DOS to use available sections of upper memory. With these utilities, you can load device drivers and TSRs into upper memory. This frees base memory for other programs, such as word processors and databases. The RUNHI utility for MS-DOS provides the ability to use upper memory. The upper memory area is established and managed by either EXMEM or CEMM. Refer to the *EZ Help Online Library,* "User Programs Support Software" section, for more information.

High Memory Area

Memory beyond the first megabyte is called extended memory, and the first 64-Kbyte section of extended memory is called the High Memory Area (HMA). The rest is called the Extended Memory Area (EMA).

The High Memory Area can be used for portions of system files, which frees base memory for other programs. The HIMEM utility and EXMEM utility manage this memory area for MS-DOS. Refer to the *EZ Help Online Library* for more information.

Extended Memory Area

Memory beyond the High Memory Area is called the Extended Memory Area. Because extended memory has a higher address range than most MS-DOS applications, such applications cannot generally use extended memory. To access this memory, the system must switch to one of two different modes, protected or virtual.

Several different methods of accessing extended memory exist. For example, many applications use DOS extenders that allow MS-DOS applications to access extended memory using the protected mode. DOS extenders are often built into MS-DOS applications that use memory heavily, such as spreadsheets and desktop publishing systems. The EXMEM and HIMEM utilities manage this memory area. Refer to the *EZ Help Online Library* for more information.

Other methods of accessing extended memory are explained fully in the *MS-DOS Reference Guide*. Also refer to the documentation includes with your application to see if it uses extended memory. You can access extended memory using the VDISK, EXMEM, CEMM, and HIMEM utilities.

Expanded Memory

Expanded memory is additional memory that MS-DOS applications can use. Expanded memory is accessed through available sections of upper memory using the Lotus/Intel/Microsoft Expanded Memory Specification (LIM EMS). EXMEM and CEMM adhere to this specification. Because expanded memory does not physically reside in system memory address space, a memory manager (EXMEM or CEMM, for example) is needed to access it. Nor does expanded memory physically reside in the 640-Kbyte address space.

Using EMS Version 3.2, MS-DOS applications can access expanded memory through a 64-Kbyte section of upper memory called a page frame. The page frame consist of four 16-Kbyte sections of memory. Each section is called an EMS page. Using EMS Version 4.0, the EMS 3.2 page frame still exits, but MS-DOS applications can also access memory through additional EMS pages.

Mapping memory through EMS pages makes it available for MS-DOS applications. To map memory, a computer needs a memory manager, such as EXMEM or CEMM.

MAXIMIZING SYSTEM MEMORY

CACHE

The disk CACHE utility improves performance by speeding access to hard drive data. Copies of the most recently accessed information and the data expected to be accessed next are placed in a portion of memory called the disk cache. Each time a sector of information is requested, the system checks to see if the data is already in the disk cache. If it is there, the data is transferred to main memory without performing a disk-read operation. This greatly reduces the amount of time needed to retrieve data in applications that are disk-read intensive.

The CACHE utility offers a queued writes option. A queued write consists of writing one sector of data to a queue in memory. Once queued, control is returned to the application you are using. The queued writes option improves performance in applications that perform single sector writes.

Expanding Memory with CEMM

The COMPAQ Expanded Memory Manager (CEMM) is a utility that extends the 640-Kbyte memory limit imposed by MS-DOS and allows MS-DOS applications to use more memory. Using the CEMM.EXE device driver adds up to 256 Kbytes of expanded memory. You can access even more expanded memory by speeding the number of Kbytes of expanded memory you want to use. This utility is useful when you want to load a large application or run more than one program at the same time.

When used in conjuction with HIMEM.EXE, as CEMM supports the eXtended Memory Specification (XMS) to provide upper memory, CEMM also provides access to extended memory in virtual mode. CEMM takes this extended memory and maps it into upper memory, creating Upper Memory Blocks (UMBs). These UMBs may then be used by MS-DOS applications.

Using Expanded and Extended Memory in Real Mode with EXMEM

The EXMEM utility (expanded memory) expands the 640-Kbyte memory limit imposed by MS-DOS allowing applications to use more memory. The expanded and extended memory provided by EXMEM is accessed in real mode, which means higher system performance. EXMEM supports extended memory in adherence to the XMS 3.0 standard. EXMEM supports EMS memory in adherence to the LIM 4.0 standard. By loading EXMEM, you will not need any other memory manager, HIMEM or CEMM, for example.

EXMEM takes extended memory and can map it into upper memory, creating Upper Memory Blocks (UMBs). There, UMBs may then be used by MS-DOS applications. EXEMEM does not require any additional memory hardware. On the 386SL-based COMPAQ Contura Personal Computers, EXMEM supports EMS, XMS, and UMB memory. On the 486SL-based COMPAQ Contura Personal Computers, EXMEM supports XMS and UMB memory.

Optimizing Memory Management with RUNHI

The RUNHI utility optimizes the way the system uses memory by loading and running device drivers and terminate-and-stay resident (TSR) programs in upper memory (640 to 1024 Kbytes). Normally MS-DOS applications use base memory, and system hardware devices use upper memory. RUNHI loads programs in available sections of upper memory, allowing MS-DOS to use base memory for additional applications.

NOTE: To use RUNHI to load programs in upper memory, you must first set up either EXMEM or CEMM with the device driver switches in your *CONFIG.SYS* file.

Using RUNHI you can do the following:

- Use programs that are too large to run in available base memory.
- Increase the memory available for other applications.
- Speed up the time it takes for large programs to operate and access information.
- Use programs you could not run previously because of memory limitations.
- Link upper memory to base memory so that MS-DOS applications can access upper memory automatically.

Improving Disk Access Time with VDISK

VDISK lets you use a portion of memory as a disk drive. These disk drives, known as virtual disks or VDISKs, are faster than mechanical disk drives since they operate at the speed of the computer memory. Because a VDISK is created from RAM, you loose any information in the VDISK when you turn off the computer or if power is interrupted. To retain data from a VDISK, you must save it to a diskette or fixed disk before turning off or resetting the computer.

HIMEM

The HIMEM utility allows MS-DOS programs to access extended memory using the eXtended Memory Specifications (XMS) Version 3.0. It allows MS-DOS programs to use the high memory area (HMA) and the Upper Memory Blocks (UMBs).

WHAT MEMORY TYPE DOES YOUR APPLICATION REQUIRE?

To find out which memory type your application requires, refer to the documentation included with the application. If it recommends using either expanded or extended memory, then use EXMEM. It provides expanded memory as well as extended memory.

Memory Configuration Example

An example is presented here to help you set up your *CONFIG.SYS* file using eight megabytes of memory. The example is set up according to the type of applications you may be running and is only a suggestion on how you could configure memory.

If you are using a spreadsheet and a database, you may set up the memory configuration of your system by editing the *CONFIG.SYS* file to include the following lines:

```
DOS = HIGH
DEVICE = EXMEM.EXE RAM 1024
DEVICE = RUNHI.EXE VDISK.SYS 1024/E:8
```

Each line of the previous file is explained below:

- DEVICE = EXMEM.EXE RAM 1024–Manages the use of expanded and extended memory applications. It allows programs to access extended memory using the XMS. Programs can also use EMS memory via EMS. It loads EXMEM and specifies that EXMEM create Upper Memory Blocks. It sets the amount of expanded memory provided by EXMEM to 1024 Kbytes.
- DEVICE = RUNHI.EXE VDISK.SYS 1024/E:8–Loads VDISK into upper memory using the RUNHI command with a virtual disk size of 1024 Kbytes in extended memory (/E). The 8 represents the maximum number of sectors to transfer to extended memory at one time.

INSTALLING A MOUSE DRIVER

Some applications already include mouse support. However, that does not always mean that you can load the program and a mouse will work. You may first have to install a mouse device driver that comes with the mouse and add a DEVICE command to your *AUTOEXEC.BAT* file. If your computer has Microsoft Windows preinstalled, the mouse/trackball driver is already installed. Next, you must remember to connect the mouse or trackball to the rear of the computer. The type of mouse you have will determine if you plug the mouse into a serial connector or into a pointing device connector.

Refer to the documentation that came with the mouse for installation instructions and to the *EZ Help Online Library* for software information.

CORRECT DISK PROBLEMS WITH CHKDSK

CHKDSK (check disk) is a MS-DOS command that checks the directories and files on a disk for errors and provides a disk and memory status report. You should run CHKDSK on each diskette and occasionally on the hard drive to verify that the directory structure is correct.

If you specify the /F switch, the CHKDSK command corrects errors if it finds any clusters allocated to the File Allocation Table (FAT) but not allocated to a file. The CHKDSK command does not correct errors on a disk unless you specify /F switch. To use the CHKDSK command to correct errors, enter the following at the system prompt:

```
CHKDSK /F
```

NOTE: Refer to the *EZ Help On Line Library*, "User Programs Support Software," for additional information on frequently used MS-DOS commands.

REINSTALLING SOFTWARE ON THE HARD DRIVE

If you need to reinstall all of the software on your hard drive, use the diskettes included with the computer and the following procedures.

DISKETTE REQUIREMENTS

You need the following diskettes:

- FASTART, Version 5.0 or higher
- User Programs MS-DOS Support
- User Programs MICROSOFT WINDOWS Support
- Microsoft WINDOWS (set of six) (available with some models)
- Mouse/Trackball (available with some models)
- PFS:WindowWorks (available with some models)

INSTALLATION PROCEDURES

To reinstall the software on your hard drive, follow these steps:

1. Insert the FASTART diskette into the diskette drive.
2. Turn on the computer. If it is already on, restart the computer by pressing the **Ctrl+Alt+Delete** keys.
3. Select AUTOMATIC or CUSTOM installation:
   - The AUTOMATIC method does the work for you by defining the partitions and configuration.
   - The CUSTOM method lets you make the decisions in defining the partitions and configuration.

   Follow the instructions on the screen to install the MS-DOS and User Programs Support Software.

(The computer restarts after installation is completed.)

If your computer came with Microsoft Windows, continue with step 4.

4. Install Microsoft Windows:
   - Insert the WINDOWS Disk 1 into the diskette drive.
   - Type
     A:\SETUP
   - Follow the instructions on the screen.

   NOTE: If your computer has Advanced Power Management (APM), you must change the machine type from "MS-DOS System" to "MS-DOS System with APM" to automatically install the APM drivers. To change the machine type, move the cursor to the field and press the **Enter** key. From the machine type menu, select MS-DOS with APM.

5. Install the Mouse/Trackball software, including the Windows and MS-DOS mouse drivers and *EZ Help Online Library* book.
   - Insert the Mouse/Trackball diskette into the diskette drive.
   - From the Program Manager File pull-down menu, select the Run option.
   - In the command line box, type
     A:\WINSTALL
   - Click OK.
   - Follow the instructions on the screen.
   - Exit Windows.
   - At the A prompt, enter
     INSTALL
   - Follow the instructions on the screen.

6. Install the User Programs Microsoft Windows support software, including the COMPAQ display driver, audio drivers, FastDisk drivers, and the Hibernation driver:
   - Insert the User Programs Microsoft Windows Support diskette into the diskette drive.
   - At the A prompt, enter

     CPQSETUP
   - Follow the instructions on the screen.

If your computer came with PFS:WindowWorks, continue with step 7.

7. Install the PFS:WindowWorks software:
   - Insert the PFS:WindowWorks diskette into the diskette drive.
   - At the system prompt, enter

     WIN
   - From the Program Manager File pull-down menu, select the Run option.
   - In the command line box, type

     A:\INSTALL
   - Click OK.
   - Follow the instructions on the screen.

TRAVELING WITH YOUR COMPUTER

This chapter contains guidelines for traveling with your computer and provides routine care suggestions to keep it working properly and ready to go.

TRAVEL GUIDELINES

The computer is designed for portability. For safety and convenience when traveling, follow these guidelines:

- Before you leave on a trip, save your information by backing it up on diskettes.
- Take an extra backup copy of the information with you.
- Do not travel with a diskette in the diskette drive.
- Do not travel with the computer turned on or in Standby.
- If you want the computer to turn on at a particular screen, initiate Hibernation before you leave.
- Close and latch the display.
- Disconnect the AC Adapter, mouse, or trackball and any external peripheral devices from the computer.
- Close the connector cover on the back of the computer.
- Take along an extra, fully charged battery pack or the AC Adapter.
- Hand-carry the computer. Do not check it with your luggage.
- If you plan to use the computer while flying, check with the airline. In-flight computer use is entirely at the discretion of the airline. Using a pointing device (trackball or mouse) with your computer is also at the discretion of the airline.
- Before traveling internationally with the computer, check local customs regulations.

- When traveling internationally, purchase an AC power cord from an Authorized COMPAQ Reseller in the country where you'll be using the computer. These power cords are designed to meet the voltage and current requirements of each country.

CAUTION: Do not use the converter kit sold for appliances to power the computer. See Appendix D, "Power Cord Set Requirements," for information about proper power cord selection.

ROUTINE CARE

Although the computer requires little care, you can keep it in good operating condition and working properly by taking a few simple precautions:

- Always operate the computer with a battery pack installed, even when you're using external power. This will supply the battery pack with a constant trickle charge and ensure a fully charged battery pack when needed. The NiMH battery pack will not fast charge in the COMPAQ Contura 3/25 and COMPAQ Contura 3/20 models with the computer turned on.
- Discharge and recharge the battery pack at least every 60 days to ensure optimal battery performance. Refer to Chapter 2, "Introducing the Computer," for complete instructions.
- Keep the computer away from excessive moisture and extreme temperatures. Never expose the computer or AC Adapter to liquids or precipitation.
- To prevent possible damage to the display, do not place anything on top of the computer when it is closed.
- Occasionally wipe the exterior of the computer and the display with a soft, damp cloth (moistened only with water). Using soap or other cleaning products may discolor the finish or damage the display.

Cleaning the COMPAQ Trackball

If your computer comes with the COMPAQ Trackball, use the following guidelines to maintain it.

Operate the trackball with clean hands. Under normal conditions, you only need to wipe the case and ball with a dry soft cloth.

If the cursor begins to skip or move abnormally when using the trackball, remove and clean the ball:

1. Turn off the computer.
2. Remove the ball retaining ring by inserting a pin in the small hole in the ring and turning the ring counter clockwise.
3. Remove the ball from the ball cage by turning the trackball on its side so that the ball falls out of the cage into you hand.
4. Clean the ball with tap water and a mild detergent. Use a clean lint-free cloth to dry the ball.
5. Remove any dust or build-up from the ball cage by blowing into it and using a cotton swab dipped in rubbing (isopropyl) alcohol to gently remove build-up that has accumulated on the rollers or tracking posts.
6. Put the ball back into the ball cage.
7. Replace the ball retaining ring by aligning it with the slots in the lower part of the trackball and turning the ring clockwise until it locks.

TROUBLESHOOTING

This chapter provides information on how to identify and correct some common battery, screen, diskette, memory, and software problems. It explains several types of common messages that you may receive on the screen. Consult Appendix B, "POST Error Messages," for any messages that may appear.

HELPFUL HINTS

If you encounter some minor problem with your computer or software application, go through the following checklist for possible solutions before running the Diagnostics utilities:

- Is the computer connected to an external power source or does it have a fully charged battery pack installed?
- Is the computer turned on and the power light green?
- Are all cables connected properly and securely?
- Did you run the SETUP utility after you installed an option?
- Have you installed all the needed device drivers? For example, if you're using a mouse, you should have installed a mouse device driver.
- Have you made all necessary changes to the *CONFIG.SYS* file?
- Have you made all necessary changes to the *AUTOEXEC.BAT* file?
- Have you installed printer drivers for each application?
- Did the diskette drive contain a "nonbootable" diskette when you turned on the computer?

INTERPRETING MESSAGES ON THE SCREEN

Many times, a message or prompt is displayed on the screen. However, a message does not necessarily mean that an error condition exists. It may be nothing more than information message about what the computer is doing or a prompt reminding you to enter information or press a key.

The following are typical examples of information messages:

- A number may be displayed.

  It indicates the amount of memory in the computer.

- Backing up files to drive A:

  This indicates that MS-DOS is backing up a file to the diskette in drive A.

- Exit this Utility.

  This message prompts you to exit the utility, usually by following the additional instructions on the screen.

- A :> or A :

  This prompt indicates that you are working from drive A.

- C :> or C :

  This prompt indicates that you are working from the hard drive.

RUNNING THE DIAGNOSTICS UTILITIES

The INSPECT and TEST utilities, located on the Diagnostics diskette, should be used when you need to identify a problem with the operation of the computer. If you encounter an error condition, complete the following steps before running either of the diagnostics utilities:

1. Turn off the computer and all external devices.
2. Disconnect all external devices, unless there is a device you particularly want to test. You also may leave the printer connected if you want to use it to log error messages.
3. Connect the AC Adapter and use it with the computer during these procedures. A low battery condition could initiate Standby and interrupt the program.

Follow the procedures in Chapter 5, "Diagnostics and Support Software Utilities and Device Drivers," for information on running the SETUP, TEST, and INSPECT utilities.

SOLVING MINOR PROBLEMS

While your computer is configured just for you, problems you encounter while working may not be unique. Eliminating the typical problems described in this section may save you time and money. If you do have a problem with your computer, consider the problems and possible solutions outlined in the following series of tables. You may discover something you can resolve easily for yourself. If the condition persists, contact your Authorized COMPAQ Reseller.

Solving Power Problems

Problem	Cause	Solution(s)
Computer will not turn on.	Battery is discharged.	1. Charge the battery pack. 2. Replace the battery pack with a fully charged battery pack. 3. Connect the computer to an external power source (AC Adapter or Automobile Adapter).
	Computer is not connected to an external power source.	Connect external power equipment such as AC Adapter or Automobile Adapter.
	Cables to the external power source are unplugged.	Ensure that cables connecting the computer and the external power source are plugged in properly.
Computer turned off while it was left unattended.	System-initiated Hibernation (if Hibernation is enabled).	Turn on the computer to return to the screen. If the battery charge is low, change the battery pack.

Solving Battery Problems

Problem	Cause	Solution(s)
Computer is beeping and lights are blinking.	Battery charge is low.	1. Charge the battery pack. 2. Replace the battery pack with a fully charged battery pack. 3. Connect the computer to an external power source (AC Adapter or Automobile Adapter). 4. Initiate Hibernation to conserve power until you can charge the battery pack or find another power source.
Computer lights blink to indicate low battery condition, but computer does not beep.	Low battery beeps were turned off.	Run the PWRCON utility and turn on the low battery warning beeps.
Battery pack won't fast charge.	Battery pack was exposed to temperature extremes.	Allow time for battery pack to return to room temperature.
	Battery Pack has low voltage.	Allow voltage to increase and fast charge to complete.

Continued

Solving Battery Problems *Continued*

Problem	Cause	Solution(s)
Computer with an optional Auxiliary Battery installed shut down and lost memory when replacing the battery pack during Standby.	The battery pack was not replaced within one minute.	Wait until the standby light comes on before removing the battery pack and insert another battery pack within one minute.
	An optional Auxiliary Battery was installed and the auxiliary battery was not charged after the installation.	Charge the Auxiliary Battery in the computer for at least 12 hours.

Solving Diskette and Diskette Drive Problems

Problem	Cause	Solution(s)
Diskette drive light stays on.	Diskette is damaged.	Run CHKDSK on the diskette.
	Diskette is incorrectly inserted.	Remove diskette and reinsert.
	Software program is damaged.	Check the program diskette.
Diskette drive cannot write to a diskette.	Diskette is not formatted.	Format the diskette.
	Diskette is write protected.	Use another diskette—one that is not write-protected.
	Writing to the wrong drive.	Check the drive letter in your path statement.
	Not enough space is left on the diskette.	Use another diskette with enough space for the information.
Diskette drive cannot read a diskette.	Diskette is not formatted.	Format the diskette.
	Using the wrong diskette type for the drive type.	Use the type of diskette required for the diskette drive.

Solving Screen Problems

Problem	Cause	Solution(s)
Characters are dim.	The brightness and contrast controls are not set properly.	Adjust the brightness and contrast controls.
Screen is blank.	You have a screen blanking utility installed.	Press any key to return your information to the screen.
	Brightness and contrast needs adjusting.	Use the controls on the display to adjust the brightness and contrast.
	Screen save was initiated.	Press any key or click the mouse to return your information to the screen.

Continued

Solving Screen Problems *Continued*

Problem	Cause	Solution(s)
Screen is blank.	System initiated a Standby condition.	Press the standby button to exit Standby.
	System initiated a low battery Standby condition.	1. Charge the battery pack. 2. Replace the battery pack with a fully charged battery pack. 3. Connect the computer to an external power source (AC Adapter or Automobile Adapter).
Garbled characters on the screen are mixed with text.	The *ANSI.SYS* driver is not in the *CONFIG.SYS* file.	Add the ANSI.SYS driver to the *CONFIG.SYS* file. Add the following line: DEVICE = C:\ANSI.SYS
Computer screen is blank and the screen on the external monitor displays information.	Display was switched to the external monitor.	Press the **Fn+F4** hotkeys to display information on the screen.

Self-Test for an External Monitor

You can perform a "self-test" on an external VGA color or monochrome monitor without the monitor being connected to the computer. To do so, complete the following steps:

1. Turn off the monitor.
2. Turn off the computer.
3. Disconnect the monitor signal cable from the computer.
4. Turn on the monitor and allow it to warm up for one minute.

The screen should be white. A narrow black border may also appear on the left and right sides of the display. Either of these displays indicate that the monitor is working properly.

Solving Keyboard/Numeric Keypad Problems

Problem	Cause	Solution(s)
Embedded numeric keypad in computer keyboard is disabled.	Num lock function is not turned on.	Press the **Fn+End** keys to enable the num lock function and embedded numeric keypad.
Embedded numeric keypad is disabled and num lock function is on.	External Numeric Keypad is connected to the computer.	Disconnect the External Numeric Keypad from the computer.

Solving Printer Problems

Problem	Cause	Solution(s)
Printer will not turn on.	The cables may not be connected properly or the printer is unplugged.	Ensure that the cables are properly connected and that the power plug is connected to the AC outlet.
Printer will not print.	Printer is not turned on.	Turn on the printer.
	Printer is not online.	Set the printer to online.
	The device drivers for your application are not installed.	Add the printer to the *CONFIG.SYS* file.
	Printer that is set up for a network is not connected to the network.	Connect the printer to a network.
Printer is off line.	Paper tray is empty.	Fill the paper tray with paper. Select online.
Printer prints garbled information.	Correct printer drivers are not installed.	Install the correct printer driver.
	Cables are not connected properly.	Ensure that the printer signal cable is connected properly to the computer.

In addition, refer to the documentation that came with your printer for additional help in solving printer problems.

Solving Hardware Installation Problems

Problem	Cause	Solution(s)
A new device is not recognized as part of the computer system.	The SETUP utility has not been run to configure the new device.	Run the SETUP utility.
	Cable(s) of new external device are loose or power cables are unplugged.	Ensure that all cables are properly and securely connected.
	Power switch of new external device is not turned on.	Turn off the computer, turn on the external device, then turn on the computer to integrate the device with the computer system.

Solving Software Application Problems

Most software application or installation problems occur as a result of one or more of the following:

- The application was not installed correctly.
- The *CONFIG.SYS* file was not configured correctly.
- Memory was not allocated correctly.
- The *AUTOEXEC.BAT* file was not edited correctly.
- A conflict exists between applications.

Problem	Cause	Solution(s)
Mouse or trackball does not work.	Incorrect or no mouse device driver is installed.	Add the correct mouse driver to the *CONFIG.SYS* file. (MS-DOS applications require an MS-DOS mouse driver. Windows applications require a Windows mouse driver.)
Cannot use application from specified directory.	The application has not been added to the *AUTOEXEC.BAT* file.	Add application to the *AUTOEXEC.BAT* file.
Insufficient memory to run application.	Memory is not configured properly for the application.	Consult the documentation that came with your application for memory requirements and configure memory to meet those requirements.

Solving Memory Problems

Problem	Cause	Solution(s)
"Out of Memory" message is displayed on the screen.	Memory Configuration is not set up correctly.	Reconfigure memory.
Memory counting during Power-on Self-Test (POST) is incorrect.	Optional memory expansion board is installed incorrectly or is incompatible with the computer.	1. Ensure that the correct memory expansion board has been installed and that it is installed correctly. 2. Run the SETUP utility.
Insufficient memory error during operation.	Too many TSR applications are installed.	Remove TSR applications from memory that you do not need.
	System ran out of memory for the application.	Check the application documentation for memory requirements or add more memory to the computer.

SERVICE

Your Authorized COMPAQ Reseller is available to answer your questions, install optional equipment, and service your computer.

To get help and service from the COMPAQ Customer Support Center and Authorized COMPAQ Reseller location, call:

- U.S. 1-800-345-1518
- Canada 1-800-263-5868

You can get help outside the U.S. and Canada from your Authorized COMPAQ Reseller.

If you take the computer to your Authorized COMPAQ Reseller for service, remember to provide the power-on password, if it is set.

Record your Authorized COMPAQ Reseller's name, address, and telephone number.

SPECIFICATIONS

This appendix provides physical, performance, and environmental specifications for subassemblies of the COMPAQ Contura Family of Personal Computers.

Computer		
COMPAQ Contura 4/25		
Dimensions		
Height	8.9 in	22.6 cm
Depth	11.7 in	29.7 cm
Width	1.9 in	4.8 cm
Weight		
Model 209/w	6.2 lb	2.80 kg
Model 120/w	6.2 lb	2.80 kg
Model 84/w	6.2 lb	2.80 kg
COMPAQ Contura 3/25c		
Dimensions		
Height	8.9 in	22.4 cm
Depth	11.7 in	29.7 cm
Width	2.1 in	5.2 cm
Weight		
Model 120/w	6.7 lb	3.0 kg
Model 84/w	6.7 lb	3.0 kg
COMPAQ Contura 3/25		
Dimensions		
Height	8.9 in	22.4 cm
Depth	11.7 in	29.7 cm
Width	1.9 in	4.8 cm
Weight		
Model 120	6.2 lb	2.8 kg
Model 84	6.2 lb	2.8 kg
Model 60	6.2 lbs	2.8 kg
COMPAQ Contura 3/20		
Dimensions		
Height	8.9 in	22.4 cm
Depth	11.7 in	29.7 cm
Width	1.9 in	4.8 cm
Weight		
Model 84	6.2 lb	2.8 kg
Model 40	6.2 lb	2.8 kg

	Color System Unit	
Standalone (Battery) Power Requirements		
Nominal Operating Voltage	12 V	12 V
Average Power	12 W	12 W
Peak Power	31 W	31 W
Temperature		
Operating	50° to 104°F	10° to 40°C
Nonoperating	-4° to 140°F	-20° to 60°C
Relative Humidity (noncondensing)		
Operating	10% to 90%	10% to 90%
Nonoperating	5% to 95%	5% to 95%
Shock and Vibrations		
Shock	10 g, 11 ms, half sine (operating) 60 g (nonoperating)	
Vibration	0.25 g, 5-500 Hz 1/2 octave/min sweep 1-hr duration (operating) 1 g, 5-500Hz, 1.0-hr duration (nonoperating)	
Maximum Unpressurized Altitude		
Operating	10,000 ft	3,658 m
Nonoperating	30,000 ft	12,192 m

Monochrome System Unit		
Standalone (Battery) Power Requirements		
Nominal Operating Voltage	12 V	12 V
Average Power	10 W	10 W
Peak Power	21 W	21 W
Temperature		
Operating	50° to 104°F	10° to 40°C
Nonoperating	-4° to 140°F	-20° to 60°C
Relative Humidity (noncondensing)		
Operating	10% to 90%	10% to 90%
Nonoperating	5% to 95%	5% to 95%
Shock and Vibrations		
Shock	10 g, 11 ms, half sine (operating) 60 g (nonoperating)	
Vibration	0.25 g, 5-500 Hz 1/2 octave/min sweep 1-hr duration (operating) 1 g, 5-500Hz, 1.0-hr duration (nonoperating)	
Maximum Unpressurized Altitude		
Operating	10,000 ft	3,658 m
Nonoperating	30,000 ft	12,192 m

Passive Matrix Color VGA Display		
Dimensions (image area)		
Height	5.67 in	14.30 cm
Width	7.56 in	19.20 cm
Diagonal Size	9.0 in	22 cm
Mounting	Internal	Internal
Display Type	CSTN-LCD	CSTN-LCD
Colors	16 High Resolution 256 Low Resolution	16 High Resolution 256 Low Resolution
Brightness/ Contrast	Adjustable	Adjustable
Maximum Pixel Resolution	640 x 480	640 x 480
Character Display	80/40 x 25	80/40 x 25
Horizontal Frequency	30 KHz	30 KHz
Vertical Frequency	70 Hz	70 Hz
Display Inverter Board		
Operating Voltage	+5 V, +18 V	+5 V, +18 V
Maximum Input Power	7.35 W	7.35 W
Maximum Output Power	5.52 W	5.52 W

Monochrome VGA Display		
Dimensions (image area)		
Height	5.67 in	14.30 cm
Width	7.56 in	19.20 cm
Diagonal Size	9.5 in	24 cm
Mounting	Internal	Internal
Display	STN-Edgelit LCD	STN-Edgelit LCD
Gray Scales	16 High Resolution 64 Low Resolution	16 High Resolution 64 Low Resolution
Brightness/ Contrast	Adjustable	Adjustable
Maximum Pixel Resolution	640 x 480	640 x480
Character Display	80/40 x 25	80/40 x 25
Horizontal Frequency	30 KHz	30 KHz
Vertical Frequency	125 Hz	125 Hz
Display Inverter Board		
Operating Voltage	+5 V, +18 V, -28 V	+5 V, +18 V, -28 V
Maximum Input Power	3.274 W	3.274 W
Maximum Output Power	2.265 W	2.265 W

Diskette Drive	
Diskette Size	3.5 in
Light Indicators	
Read/Write (high density)	Green
Read/Write (low density)	Green
Capacity Per Diskette	
High Density	1.44 MB
Low density	720 K
Drives Supported	One
Drive Rotation (rpm)	300
Transfer Rate (bps)	
High density	500 K
Low density	250 K
Sectors Per Track	
High density	18
Low density	9
Bytes Per Sector	512
Tracks Per Side	
High density	80
Low density	80
Access Times (ms)	
Track-to-track (high/low)	3/6
Average (high/low)	79/158
Settling time	15
Latency Average	100
Cylinders	
High density	80
Low density	80
Read/Write Heads	2

Hard Drives			
	209-MB	**120-MB**	**84-MB**
Light Indicators	Green	Green	Green
Capacity Per Drive (MB)	209.3	121.4	84.3
Drives Supported	One	One	One
Form Factor (in)	2.5	2.5	2.5
Drive Type	16	50	27
Maximum Transfer Rate at Head (Mbit/sec)	16	14.5	12
Sector Interleave	1:1	1:1	1:1
Controller	Integrated	Integrated	Integrated
Physical Configuration			
Cylinders	1530	1122	1097
Heads	6	4	4
Sectors per track	37-51	54	39
Bytes per sector	512	512	512
Logical Configuration			
Cylinders	983	760	832
Heads	13	8	6
Sectors per track	32	39	33
Bytes per sector	512	512	512
Seek Times (Typical, Including settling in ms)			
Track-to-track	5	8	8
Average	16	19	19

Continued

Hard Drives *Continued*

	60-MB	40-MB
Light Indicators	Green	Green
Capacity Per Drive (MB)	63.8	42.6
Drives Supported	One	One
Form Factor (in)	2.5	2.5
Drive Type	60	53
Maximum Transfer Rate at Head (Mbit/sec)	12	12
Sector Interleave	1:1	1:1
Controller	Integrated	Integrated
Physical Configuration		
Cylinders	823	1097
Heads	4	2
Sectors per track	39	39
Bytes per sector	512	512
Logical Configuration		
Cylinders	820	548
Heads	4	4
Sectors per track	38	38
Bytes per sector	512	512
Seek Times (Typical, Including settling in ms)		
Track-to-track	8	8
Average	19	19

Internal Power Supply		
Input Requirements		
Input voltage (nominal)	10 - 18 Vdc	
Standby	6 - 10 Vdc	
Input fuse	5.0 A (battery connection only)	
Power Output		
Steady state	15 W	
Peak	15 W	
VDC Output	**V01(+5)**	**V02(-28)**
Nominal voltage	5.10 Vdc	-28.0 Vdc
Current minimum	0.5A	0.006 A
Nominal continuous current maximum	3.0 A	3.0 A
Maximum peak current*	>3.0 A	>0.03 A
Regulation tolerance	+/-3%	+/-10%

* Peak will not exceed a 5% duty cycle or a 30 seconds continuous.

AC Adapter		
Dimensions		
Height	1.4 in	4.97 cm
Depth	3.3 in	8.38 cm
Width	5.3 in	13.46 cm
Weight	0.8 lb	1.76 kg
Power Supply		
Operating voltage	100-120/220-240 VAC	
Maximum output voltage	18.5 V +/-3%	
Maximum output current	2.2 A	
Maximum output power	30 W	
Operating current	0.8 A/0.4 max RMS	
Frequency	50-60 Hz	

Enhanced Nickel Cadmium Battery Pack		
Dimensions		
Height	.85 in	21.5 cm
Length	6.87 in	174. 4 cm
Width	2.97 in	75.4 cm
Weight	1.1 lb	500 gm
Energy	20.4 Wh	
Voltage	12.0 V	
Capacity	1.7 Ah	
Environmental Requirements		
Temperature Operating	50°F to 104°F	10° C to 40°C
Storage Temperature	-4°F to 122°F	-20°C to 50°C

Nickel Metal Hydride Battery Pack		
Dimensions		
Height	.85 in	21.5 cm
Length	6.87 in	174. 4 cm
Width	2.97 in	75.4 cm
Weight	1.24 lb	562.5 gm
Energy	24.4 Wh	
Voltage	12.0 V	
Capacity	2.2 Ah	
Environmental Requirements		
Temperature Operating	50°F to 104°F	10°C to 40°C
Storage Temperature	-4°F to 86°F	-20°C to 30°C

POST ERROR MESSAGES

The following table lists the error codes that you may encounter during the Power-On Self-Test (POST). If an error code is displayed on the screen during POST or after restarting the system, follow the instructions in the recommended "Action" column.

POST Error Codes

Error Code	Beeps*	Probable Cause	Action
101-ROM Error	1L, 1S	ROM checksum option	Contact Authorized Reseller.
101-I/O ROM Error	1L, 1S	System ROM	Contact Authorized Reseller.
101-I/O ROM Error	1L, 1S	VDU ROM checksum error	Contact Authorized Reseller.
101-I/O	1L, 1S	VDU ROM checksum for any VDU	Contact Authorized Reseller.
No Message	1L, 2S	No VDU test failed	Contact Authorized Reseller.
No Message	1L, 2S	No VDU installed	Contact Authorized Reseller.
101-ROM Error	1L, 1S	System, ROM checksum error	Contact Authorized Reseller.
101-I/O ROM Error	1L, 1S	Option ROM does not pass the checksum	Contact Authorized Reseller.

*L= Long; S=Short
Beeps can be disabled by the user during the SETUP utility.

Continued

POST Error Codes *Continued*

Error Code	Beeps*	Probable Cause	Action
101-ROM Error	1L, 1S	Second system ROM does not pass the checksum	Contact Authorized Reseller.
102-System Board or System Memory Failure	None	System Board	Contact Authorized Reseller.
102-System Board Failure	None	Counter zero check failed	Contact Authorized Reseller.
102-System Board Failure	None	Refresh bit does not toggle	Contact Authorized Reseller.
102-System Board Failure	None	CMOS read/write failed	Contact Authorized Reseller.
102-System Board Failure	None	DMA register read/write test failed	Contact Authorized Reseller.
102-System Board Failure	None	Protected mode test failed enabling/ disabling A20 or entering/exiting protected mode	Contact Authorized Reseller.
102-System Board Failure	None	Failed entering protected mode for memory test	Contact Authorized Reseller.
102-System Board Failure	None	Test of timer zero interrupt failed (no interrupt occurred)	Contact Authorized Reseller.

*L= Long; S=Short
Beeps can be disabled by the user during the SETUP utility.

Continued

POST Error Codes *Continued*

Error Code	Beeps*	Probable Cause	Action
162-System Options Error	2S	Configuration error	Run SETUP.
162-System Options Not Set	2S	Configuration incorrect	Run SETUP.
162-System Options Not Set (Run SETUP)	2S	CMOS reflects that an invalid configuration has been set	Run SETUP.
163-Time & Date Not Set	2S	Invalid time or date configuration memory	Run SETUP.
163-Time & Date Not Set	2S	Invalid time	Run SETUP.
164-Memory Size Error	2S	Discrepancy in the memory size found compared to the one stored in CMOS	Run SETUP.
164-Memory Size Error	2S	Configuration memory incorrect	Run SETUP.
167-RTC Lost Power	2S	Real-time clock/calendar battery	Contact Authorized Reseller.
167-RTC Lost Power 0Dh, 0Ah	None	RTC has lost power. This only shows up on a cold boot	Contact Authorized Reseller.
XX000YZZ 201-Memory Error	None	RAM failure	Contact Authorized Reseller.

*L= Long; S=Short
Beeps can be disabled by the user during the SETUP utility.

Continued

POST Error Codes *Continued*

Error Code	Beeps*	Probable Cause	Action
201-Memory Error	None	Base 128K memory error within the data	Contact Authorized Reseller.
201-Memory Error	None	Base 128K memory from parity	Contact Authorized Reseller.
201-Memory Error	None	Memory test data error	Contact Authorized Reseller.
XX000YZZ	None	RAM failure	Contact Authorized Reseller.
203-Memory Address Error	None	Memory test high address line error	Contact Authorized Reseller.
205-Memory Error	None	Cache memory error	Run Diagnostics.
205-Memory Error	None	Cache memory data error	Contact Authorized Reseller.
208-Invalid Memory Expansion Board	None	The memory expansion board is an invalid type	Replace memory expansion board.
301-Keyboard Error	None	Keyboard	Contact Authorized Reseller.
301-Keyboard Error or Test Fixture Installed	None	Keyboard	Contact Authorized Reseller.
301-Keyboard Error	None	Keyboard failed interface test	Contact Authorized Reseller.

*L= Long; S=Short
Beeps can be disabled by the user during the SETUP utility.

Continued

POST Error Codes *Continued*

Error Code	Beeps*	Probable Cause	Action
301-Keyboard Error or Test Fixture Installed	None	Keyboard loopback plug installed	Contact Authorized Reseller.
301-Keyboard Error	None	Bad results from keyboard test	Contact Authorized Reseller.
303-Keyboard Controller Error	None	8042 error disabling the keyboard or mouse	Contact Authorized Reseller.
303-Keyboard Controller Error	None	8042 error clearing the output buffer	Contact Authorized Reseller.
303-Keyboard Controller Error	None	Keyboard controller (8042) self-test failed	Contact Authorized Reseller.
303-Keyboard Controller Error	None	System board keyboard controller	Contact Authorized Reseller.
303-Keyboard Controller Error	None	Reset of A20 line failed	Contact Authorized Reseller.
304-Keyboard or System Unit error	None	Keyboard	Contact Authorized Reseller.
304-Keyboard or System Unit Error	None	Reset of keyboard failed	Contact Authorized Reseller.

*L= Long; S=Short
Beeps can be disabled by the user during the SETUP utility.

Continued

POST Error Codes *Continued*

Error Code	Beeps*	Probable Cause	Action
601-Diskette Controller Error	None	Diskette Controller circuitry	1. Run Diagnostics. 2. Contact Authorized Reseller.
601-Diskette Controller Error	None	Drive A: failed recalibration	Contact Authorized Reseller.
605-Diskette Drive Error	None	Mismatch in drive type	Run SETUP.
605-Diskette Drive Type Error-(Run SETUP)	2S	Disk type does not match the drive	Run SETUP.
702-Coproc-essor Detection Error	None	Coprocessor problem; added or removed the coprocessor	1. Run SETUP. 2. Replace the coprocessor. 3. Contact Authorized Reseller.
702-Coproc-essor Detection Error	None	CMOS disagrees with the test of the coprocessor	1. Check installation. 2. Run SETUP. 3. Contact Authorized Reseller.

*L= Long; S=Short
Beeps can be disabled by the user during the SETUP utility.

Continued

POST Error Codes *Continued*

Error Code	Beeps*	Probable Cause	Action
1125-Internal Serial Port Failure	None	Defective internal port	Contact Authorized Reseller.
1125-Internal Serial Port Failure	2S	Internal serial port failed to respond	Contact Authorized Reseller.
1150-COMM Port Configuration Error (Run SETUP)	2S	Test to make sure that two serial ports are not configured for the same address failed	Contact Authorized Reseller.
1150-COMM Port Configuration Error	2S	Added or removed modem, or serial interface board	Run SETUP.
1717-Primary Disk Port Address Assignment	2S	The hard drive controller is detected on the bus but the internal controller is not disabled	Contact Authorized Reseller.
1771-Primary Disk Port Address Assignment Conflict -(Run SETUP)	2S	Test to make sure that two hard drive controllers are not configured for the same address failed	Contact Authorized Reseller.
1782-Disk Controller Failure	2S	Reset of the hard drive subsystem failed	Contact Authorized Reseller.

*L= Long; S=Short
Beeps can be disabled by the user during the SETUP utility.

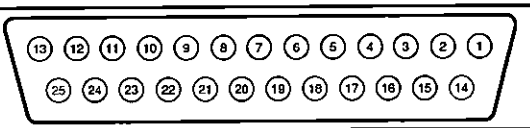
Continued

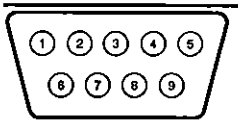
POST Error Codes *Continued*

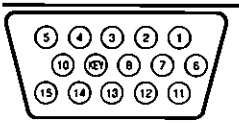
Error Code	Beeps*	Probable Cause	Action
1780-Disk 0 Failure	None	Disk 0 failed to respond	Contact Authorized Reseller.
1780-Disk 0 Failure	None	Hard drive format error	Contact Authorized Reseller.
1781-Disk 1 Failure	None	Disk 1 failed to respond	Contact Authorized Reseller.
1781-Disk 1 Failure	None	Hard drive format error	Contact Authorized Reseller.
1782-Disk Controller Failure	None	Hard drive controller error	Contact Authorized Reseller.
1790-Disk 0 Error	None	Disk 0 responded with an error	Contact Authorized Reseller.
1790-Disk 0 Error	None	Hard drive error	Contact Authorized Reseller.
1791-Disk 1 Error	None	Disk 1 responded with an error	Contact Authorized Reseller.
1791-Disk 1 Error	None	Hard drive 1 error	Contact Authorized Reseller.
XX000YZZ Parity Check 2	None	Parity RAM failure	Run Diagnostics.
Audible	1S	Power-on successful	None.
Audible	2S	Power-on successful	None.
(Resume= "**F1**" Key)	None	As indicated to continue	Press **F1** key.

*L= Long; S=Short
Beeps can be disabled by the user during the SETUP utility.

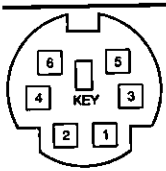
CONNECTOR PIN ASSIGNMENTS

Parallel Connector	
	
Pin	**Signal**
1	Strobe
2	Data Bit 0
3	Data Bit 1
4	Data Bit 2
5	Data Bit 3
6	Data Bit 4
7	Data Bit 5
8	Data Bit 6
9	Data Bit 7
10	Acknowledge
11	Busy
12	Paper Out
13	Select
14	Auto Linefeed
15	Error
16	Initialize Printer
17	Select In
18	Ground
19	Ground
20	Ground
21	Ground
22	Ground
23	Ground
24	Ground
25	Ground

Serial		
Connector	**Pin**	**Signal**
	1	Carrier Detect
	2	Receive Data
	3	Transmit Data
	4	Data Terminal Ready
	5	Ground
	6	Data Set Ready
	7	Ready to Send
	8	Clear to Send
	9	Ring Indicator

External VGA Monitor		
Connector	**Pin**	**Signal**
	1	Red Analog
	2	Green Analog
	3	Blue Analog
	4	Not Connected
	5	Ground
	6	Ground Analog
	7	Ground Analog
	8	Ground Analog
	9	Not Connected
	10	Ground
	11	Not Connected
	12	Horizontal Synch
	13	Vertical Synch
	14	Vertical Synch
	15	Not Connected

External Numeric Keypad		
	Pin	**Signal**
	Shell	Ground
	1	Keypad Data

Keyboard/Mouse		
Connector	**Pin**	**Signal**
	1	Keyboard Data/Mouse Data
	2	Reserved
	3	Ground
	4	+5 VDC
	5	Keyboard Clock
	6	Reserved

POWER CORD SET REQUIREMENTS

The wide range input feature permits the computer to operate from any line voltage from 100 to 270 volts AC.

The power cord set (power cord) you received with your computer meets the requirements of the country where you purchased the system. If you use the computer in another country, you must use a power cord that meets the requirements of that country. For more information on power cord set requirements, contact your Authorized COMPAQ Reseller.

The following information explains the requirements for power cord set selection.

GENERAL INFORMATION

1. The cord set must be approved for the country where it will be used.
2. The appliance coupler (that is, the connector to the device itself, not the wall plug) must have a configuration for mating with a CEE22/IEC 320 appliance inlet (Standard Sheet C14).
3. The length of the cord set must be as follows:
   - Minimum 6.50 ft. (2.0 m)
   - Maximum 9.75 ft (3.0 m)

U.S. and Canada

1. The cord set must be UL-Listed and CSA-Certified.
2. The minimum specifications for the flexible cord are:
   - No. 18 AWG
   - Type SV or equivalent
   - 3-Conductor
3. The cord set must have a rated current capacity of at least 10A.
4. The attachment plug must be an earth-grounding type with a NEMA 5-15P (15A, 125V) or NEMA 6-15P (15A, 250V) configuration.

Other Countries

1. The cord set fittings must bear the certification mark of the agency responsible for evaluation in a specific country. Acceptable agencies include:

BSI (United Kingdom)	NEMKO (Norway)
CEBEC (Belgium)	OVE (Austria)
DEMKO (Denmark)	SEMKO (Sweden)
EANSW (Australia)	SETI (Finland)
IMQ (Italy)	SEV (Switzerland)
KEMA (The Netherlands)	UTE (France)
VDE (Germany)	

2. The flexible cord must be of a HAR (harmonized) type HO5VV-F 3-conductor cord with a minimum conductor size of .03 square inches (1.0 square millimeters).
3. The cord set must have a current capacity of at least 10A and a nominal voltage rating of 125 or 250 VAC, as required by each country's power system.

Japan Specifications

Japan requires the following wire type and ratings for power cords.

1. All components of the cord set (cord, receptacle, and plug) must bear a "T" mark and registration number in accordance with the Japanese Dentori Law.
2. The minimum specifications for the flexible cord are:
   - .75mm 2 conductors
   - Type VCT or VCTF
   - 3-Conductor
3. The cordset must have a minimum rated current capacity of 7A.
4. The attachment plug must be a two-pole, earth-grounding type with a Japanese Industrial Standard C8303 (15A, 125V) configuration.

ELECTROSTATIC DISCHARGE

A discharge of static electricity from a finger or other conductor may damage system boards or other static-sensitive devices. This type of damage may reduce the life expectancy of the device.

PREVENTING ELECTROSTATIC DISCHARGE

To prevent electrostatic damage, observe the following precautions:

- Avoid hand contact by transporting and storing products in static-safe containers.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free workstations.
- Place parts on a grounded surface before removing them from their containers.
- Avoid touching pins, leads, or circuitry.
- Always be properly grounded when touching a static-sensitive component or assembly.

Grounding Methods

There are several methods for grounding. Use one or more of the following methods when handling or installing electrostatic-sensitive parts:

- Use a wrist strap connected by a ground cord to a grounded workstation or computer chassis. Wrist straps are flexible straps with a minimum of 1 megohm +/- 10 percent resistance in the ground cords. To provide proper ground, wear the strap snug against the skin.
- Use heelstraps, toestraps, or bootstraps at standing workstations. Wear the straps on both feet when standing on conductive floors or dissipating floor mats.

- Use conductive field service tools.
- Use a portable field service kit with a folding static-dissipating work mat.
- If you do not have any of the suggested equipment for proper grounding, have an Authorized COMPAQ Reseller install the part.

IMPORTANT: For more information on static electricity, or assistance with product installation, contact your Authorized COMPAQ Reseller.

REGULATORY AGENCY IDENTIFICATION NUMBERS

Optional equipment for the COMPAQ Contura Family of Personal Computers is assigned the following series numbers for regulatory agency identification:

Regulatory Agency Identification Numbers

Options	Series Numbers
SpeedPAQ 144 Modem	2818
Enhanced 2400-Baud Internal Modem	2805
Enhanced 9600-bps Internal Modem	2816
Internal Data + Fax Modem	2817
External Numeric Keypad	2697
Nickel Cadmium Battery Pack	2821A
Nickel Metal Hydride Battery Pack	2821
Battery Fastcharger/Discharger	2823
Automobile Adapter	2824
AC Adapter	2822

GLOSSARY

A

AC Adapter — A self-contained power supply that converts alternating current (AC) to direct current (DC) required by the computer. The AC Adapter provides external power to the computer and simultaneously charges the battery pack. The AC Adapter also connects to an optional Battery Fastcharger/ Discharger, which provides AC power to fast charge up to two battery packs or discharge one battery pack.

AC power — The alternating electrical current in an AC outlet.

ADAPT — Advanced Display Attribute Programming Tool. A User Programs utility that changes how the text looks on the screen, sets the screen save timeout, and sets and locks the cursor size. Changes made with ADAPT are cleared when the computer is turned off or restarted.

ANSI.SYS — An MS-DOS device driver that specifies standard functions that change the display, control cursor movement, and reassign keys on the keyboard. (ANSI is an acronym for American National Standards Institute.

AUTOEXEC.BAT file	A batch file that contains a series of commands that MS-DOS runs each time the computer is turned on or restarted. The *AUTOEXEC.BAT* file eliminates the need for entering these commands each time the computer is turned on or restarted. For example, the *AUTOEXEC.BAT* file often contains a PATH command that tells MS-DOS where to find the command files on the hard disk and a prompt command that sets the system prompt to show the current directory.
Automobile Adapter	Optional equipment that connects to the computer, providing vehicle battery power to the computer and fast charging the battery pack in the computer. The Automobile Adapter also connects to an optional Battery Fastcharger/ Discharger, which provides vehicle battery power to fast charge up to two battery packs or discharge one battery pack.
auxiliary battery	An optional battery that provides power to the computer during Standby so that the battery pack can be replaced without turning off the computer. The auxiliary battery provides power for up to one minute.

B

base memory	The section of memory between 0 and 640 Kbytes where most MS-DOS applications run.
Battery Fastcharger/ Discharger	Optional hardware equipment that connects to the AC Adapter or Automobile Adapter and fast charges up to two battery packs. It takes approximately 1.5 hours to fast charge a fully discharged battery pack. A battery pack should be discharged and recharged at least every 60 days to maintain its optimum performance. It takes approximately 3 hours to discharge a fully charged battery pack. When the discharge is complete, the Battery Fastcharger/Discharger automatically begins fast charging the battery pack.
battery gauge	A popup window that displays the approximate charge remaining in the form or a bar graph. The popup window can be displayed from within an application by pressing the **Fn** + **F7** hotkeys. The battery gauge also can be displayed by running the PWRCON or SETUP utility.
battery pack	A rechargeable battery that supplies internal power to the computer when external power is unavailable. A fully charged battery pack supplies 3 hours of operating time under typical conditions using the medium (default) level of power conservation.
bit	The smallest unit of information recognized by the computer.

bootable diskette — A diskette that contains part of an operating system or a startup procedure required to start the computer for the diskette drive (or drive A).

byte — Eight bits treated as a unit and representing a character.

C

CACHE — A User Programs utility that improves system performance by decreasing the time it takes for an application to access data from the hard drive.

CHKDSK — An MS-DOS command that checks a directory on a disk for errors. CHKDSK checks the files to ensure that they are recorded properly.

COM — A serial interface identifier, that is, COM1 and COM2.

CONFIG.SYS file — A configuration file in the DOS directory that contains commands that effect how MS-DOS runs on the computer and communicates with other equipment. The commands in this file help define the computer configuration (or setup). Configuration commands are not typed at the keyboard. MS-DOS carries out the command in the *CONF.SYS* file each time the computer is turned on or restarted, therefore, when a command in the file is changed, the computer must be restarted before the command takes effect.

configure	To assemble a group of hardware devices and software programs into a system and adjust each component so that they work together to optimize computer operations.
configuration	The type of hardware and software in a computer system.
coprocessor	A supplementary microprocessor that does numeric computations in mathematics-intensive operations, thus removing the activity from the central microprocessor.

D

default	A value used by a computer system unless the user alters it to use a different value.
device driver	Software that controls and communicates with system hardware. Device drivers, included with the operating system, must be added to the *CONFIG.SYS* file to optimize system operations.
diagnostics	The SETUP, TEST, and INSPECT utilities that configure the computer system, test for proper functioning of the components, and identify the configuration.
direct current (DC)	A nonalternating current that powers the computer. The AC Adapter converts alternating current to direct current required by the computer.

diskette	The removable media onto which the diskette drive writes and from which it retrieves information. A 3.5-inch diskette is a flexible magnetic disk enclosed in a hard plastic container. A 5.25-inch diskette is a flexible magnetic disk enclosed in a protective sleeve. *Also called* floppy disk.
discharge	A deep cycle charge that fully discharges the battery pack. The battery pack can be discharged in the computer or in the optional Battery Fastcharger/ Discharger.
diskette drive	A mass storage device that reads information from, and writes information to, a diskette.
dynamic random access memory (DRAM)	A type of system memory that must be rewritten (or refreshed) every few milliseconds to retain valid information.*Contrast with* static RAM.

E

embedded numeric keypad	A section of the main keyboard that converts to a numeric keypad when the num lock function is turned on by pressing the **Fn** + **NumLk** keys. It also contains cursor- and screen-control keys that are accessed by pressing and holding the **Shift** key when the num lock function is on.

enhanced parallel interface	An information interchange link be tween two devices that transmits and receives data in a parallel manner; that is, one byte at a time using a separate data line for each bit. The enhanced parallel interface is a high-speed interface that requires no external buffers, is compatible with Industry Standard Architecture (ISA) unidirectional and PS/2 bidirectional interfaces, has three programmable base addresses (LPT1, LPT2, and LPT3), and has software controlled protocol.
error code	A number that references a hardware or software malfunction.
EXMEM	The User Programs memory manager utility that allows MS-DOS applications to access memory above 640 Kbytes at a high rate of speed, taking advantage of the capabilities of the 386SL chipset in the computer. EXMEM provides up to 19 megabytes of expanded and extended memory. With EXMEM, extended and expanded memory are accessed in real mode. EXMEM supports the Lotus/ Intel/Microsoft Expanded Memory Specification (EMS) Version 4.0 and eXtended Memory Specification (XMS) Version 3.0.

expanded memory

Memory that MS-DOS applications can access between base memory (640 Kbytes) and 1 megabyte of memory and that is made available by memory manager software supporting the Lotus/Intel/Microsoft (LIM) Expanded Memory Specification (EMS) standard.

extended memory

Memory beyond the 1-megabyte boundary that MS-DOS applications cannot normally access and that is made available by memory manager software supporting the Lotus/Intel/Microsoft (LIM) eXtended Memory Specification (XMS) standard.

external device

Hardware equipment connected to the computer that is used for input/output operations with the central processing unit.

F

fast charge

For a nickel cadmium (NiCd) battery pack, a 1.5- to 3-hour charge, depending on whether the computer is off or on. For a nickel metal hydride battery pack, a 1-hour charge when the computer is off or on. The Battery Fastcharger/Discharger also fast charges both types of battery packs in 1 to 1.5 hours.

FASTART

A COMPAQ utility that provides a quick and easy method of configuring the system, formatting and partitioning the hard disk, installing the operating system and COMPAQ User Programs utilities, and creating the *CONFIG.SYS* and *AUTOEXEC.BAT* files.

floppy disk

The removable media onto which the diskette drive writes and stores, and from which it retrieves, data. A 3.5-inch diskette is a thin flexible magnetic disk enclosed in a hard plastic container. A 5.25-inch diskette is a thin flexible magnetic disk enclosed in a protective sleeve. *Same as* diskette.

G

graphics mode

An operating mode in which the display capability is not limited to the use of text characters or character sets. Contrast with text mode.

gray shades

The number of distinct shades that the computer is capable of displaying on the screen. The computer displays 16 shades of gray.

H

hard drive

A mass storage device that reads information from, and writes information to, an unremovable rigid magnetic disk enclosed in a permanently sealed housing.

Hibernation

A condition that protects against the loss of information from a discharged battery pack when the computer is left unattended. During Hibernation, information in memory is saved to the hard disk, and power to the computer is turned off. When the computer is turned on, the information is restored at the point where Hibernation was initiated. Hibernation also can be used as a bookmark or to automatically turn the computer off to save battery power.

hotkeys

Keys (**Fn** + **F3** through **F7**) that simplify performing special computer operations. The special hotkey features are activated by pressing the **Fn** key and the function key. Changes made using hotkeys are cleared when the computer is turned off or restarted. The function keys work as normally defined by application software when they are not used in conjunction with the **Fn** key.

I

icon

A graphic representation. In a Windows-based application, a graphic that serves as a reminder of the presence of a program, file, or information that is closed but available for access at any time.

INSPECT	A diagnostic utility that provides information about the operating environment once the computer is configured. It includes information about the operating system startup files, memory configuration, read only memory (ROM) version, processor and coprocessor, diskette and hard drives, and communications devices and interfaces.
interface	An information interchange path that allows parts of a computer, multiple computers, and external equipment to communicate or interact. *Also called* port.
interface address	An input/output (I/O) port location assigned to a communications device.

K

Kbyte	One kilobyte. A unit of measure for storage capacity. The amount of storage equal to 1024 bytes.
keyboard password	A software security feature that disables the keyboard and mouse (or other pointing device) and clears the screen (if desired) until a preset secret word or code is entered. The keyboard password is cleared when the computer is turned off or restarted.
kilobyte	A unit of measure for storage capacity. The amount of storage equal to 1,024 bytes. *Same as* Kbyte.

KP

A User Programs utility that enables a keyboard password, which locks the keyboard and mouse (or other pointing device) until the keyboard password is entered. A keyboard password can be used in conjunction with QuickLock/ QuickBlank so that the keyboard and mouse can be locked and the screen cleared without exiting an application.

L

LIM Standard

The Lotus/Intel/Microsoft Expanded Memory Specification developed to permit access to memory beyond the 640-Kbyte limit imposed by MS-DOS. The User Programs support software supports LIM Version 4.0.

LMOUSE.DRV

A Windows mouse device driver that contains the basic instructions required for a trackball or mouse to work with three-button functionality under Microsoft Windows 3.0 or higher.

logical drive

A portion of a mass storage device that is perceived and treated as an independent physical drive. A logical drive is designated by a drive letter that a computer program uses to identify where information is stored.

low battery

A condition under battery-powered operations in which the battery pack is nearing the end of its charge. Low Battery 1 is a condition in which approximately 6 percent of operating time remains. Low Battery 2 is a critically low battery condition in which approximately 2 percent of operating time remains.

LPT	A parallel interface identifier; that is, LPT1 through LPT3.
LVMD.386	A Windows mouse device driver that contains the basic instructions required for a trackball or mouse to work with three-button functionality under Microsoft Windows 3.0 or higher in 386 enhanced mode.

M

mapping	A process by which a system translates data from one coordinate system into a form useful on another coordinate system.
mass storage device	A mechanism that reads, writes, and stores programs and information (data) files. Mass storage devices include diskette drives, hard drives, and tape drives.
megabyte (MB)	A unit of measure for storage capacity: 1,048,576 bytes when referring to system memory capacity, one million bytes when referring to hard drive capacity.
memory	A storage device (computer chip or chips) in the computer into which instructions and other information (data) are entered and retrieved when needed for processing.
microprocessor	An electronic chip that is the main controller and data processor of the computer. *Also called* processor, CPU.

Microsoft Disk Operating System (MS-DOS)	The software that controls the execution of computer programs and that may also control input/output, scheduling, data management, and interaction with mass storage devices.
Microsoft Windows	A graphical interface software program that provides the ability to run more than one application at a time, transfer information between applications, and manage and organize files.
mode	A method the microprocessor uses to address, manage, and protect memory. Each mode contains a set of instructions that include which memory addresses the microprocessor can access. The mode the system operates in depends on the type of microprocessor in the computer. Three modes of operation exist: (1) real (8088, 8086, 286, 386, 486 microprocessors); (2) protected (286, 386, 486 microprocessors); and (3) virtual (386, 486 microprocessors).
MODE SCREENSAVE	A User Programs utility that sets the number of minutes of keyboard and mouse inactivity before the screen clears.
MODE SPEED	A User Programs utility that changes the computer operating speed if needed for compatibility with certain applications. The operating speed returns to the default speed when the computer is turned off or restarted. Several MODE SPEED settings can be set at the system prompt.
modem	A communications device that allows information to be exchanged between computers over telephone lines.

MOUSE.COM

The default DOS mouse device driver used for most DOS applications. The driver contains the basic instructions required for a trackball or mouse to work with mouse-based applications. MOUSE.COM can be activated (or loaded into memory) from the directory where it is installed or added to the *AUTOEXEC.BAT* file so that it is activated every time the computer is turned on.

MOUSE.SYS

A DOS mouse driver that can be used for dedicated mouse-based applications that need a minimum of user control. The driver contains the basic instructions required for a trackball or mouse to work with DOS applications. *MOUSE.SYS* must be added to the *CONFIG.SYS* file with a device statement before it can be activated (or unloaded from memory). To deactivate *MOUSE.SYS*, the *CONFIG.SYS* file must be modified and the computer restarted.

N

national keyboard

A keyboard with an extra alternate graphics key that enables special characters to be displayed.

nickel cadmium (NiCd) battery pack

An enhanced-capacity, rechargeable battery that supplies internal power to the computer when external power is unavailable. A fully charged battery pack supplies 3 hours of operating time under typical conditions using COMPAQ power conservation features.

nickel metal hydride (NiMH) battery pack	A high-capacity, rechargeable battery that supplies internal power to the computer when external power is unavailable. A fully charged battery pack supplies 3 hours of operating time under typical conditions using COMPAQ power conservation features.
nonbootable diskette	A diskette that does not contain part of an operating system or a startup procedure that is required to start the computer from the diskette drive (or drive A).

O

operating speed	The speed in megahertz (MHz) at which the system processes information. (Megahertz is a unit of measure of frequency.) *Also called* processor speed, system speed, CPU speed.
option	The internal or external hardware equipment (or device) that is added to a computer system to expand or enhance capabilities (for example, a modem, mass storage device, keyboard, monitor, or printer). Also called peripheral.

P

passive matrix color VGA display	A super-twisted nematic (STN) Liquid Crystal Display (LCD) with a color filter in which a single transistor controls an entire column or row of electrodes.
path	An MS-DOS command that sets a search procedure for commands and batch files that are not in the current directory.

peripheral	An internal or external device that is added to a computer system to expand or enhance operations (for example, a modem, mass storage device, keyboard, monitor, or printer). Also called option.
port	An information interchange path that allows parts of a computer, multiple computers, and external equipment to communicate or interact. *Same as* interface.
power conservation	The combination of hardware and software features designed to extend the operating time of the battery pack.
power-on password	A software security feature that permits computer operation only after entering a unique, preset, secret word or code.
Power-On Self-Test (POST)	A sequence of tests automatically run by the computer when it is turned on. The tests count and display the amount of memory and check the various system components.
processor	An electronic chip that is the main controller and data processor of the computer. *Same as* microprocessor, CPU.
PS/2 mouse	A type of external pointing device with a round 6-pin connector that plugs into the keyboard/mouse connector on the computer.
PS/2 trackball	A type of external pointing device (or portable mouse) that requires very little space or wrist movement to operate. It has a round 6-pin connector that plugs into the keyboard/mouse connector on the computer.

PWRCON	A User Programs utility that sets power conservation parameters.

Q

QuickLock/QuickBlank	A security hotkey feature that disables the keyboard and pointing device without exiting an application. With QuickLock, the application remains in view on the screen, but cannot be accessed through the keyboard. A password is required to reenable the keyboard. QuickBlank can be used in conjunction with QuickLock to clear the screen when the keyboard is disabled.

R

random access memory (RAM)	A storage device into which informa tion is entered and retrieved. RAM does not retain information when the computer power is turned off.
read only memory (ROM)	A storage device for system instruc tions that retains information without power applied (or when computer power is turned off). It contains the Basic Input/Output System (BIOS), which is a collection of instructions and routines that helps the microprocessor work with the computer components. It also contains the Power-On Self-Test that is automatically run to check the computer components when the computer is turned on. Read only memory cannot be modified by the user.

real mode — An operating mode that 8088, 8086, 286, 386, and 486 microprocessors use to address the first megabyte of memory. In real mode, the memory address requested by an application program is the same as the physical address in memory. The EXMEM User Programs utility allows extended and expanded memory to use real mode.

restart — Resetting the system without turning off the computer power. The system is restarted by pressing the **Ctrl** + **Alt** + **Delete** keys. (Use the **Delete** key in the upper-right corner of the keyboard.) Information not saved before restarting the system is lost.

RUNHI — A memory utility that loads device drivers and terminate-and-stay-resident (TSR) programs in upper memory and frees base memory so that it can be used by other applications.

S

screen save — A function that clears the screen after a specified period of keyboard, trackball, or mouse inactivity (called a timeout). It works when the computer is running either on external or battery power.

serial interface — An information interchange link between two devices that transmits and receives data in a serial manner; that is, a single wire transmitting data one bit at a time and another wire receiving data one bit at a time.

serial mouse — A type of external pointing device with a D-shaped 9-pin connector that plugs into the serial connector on the computer.

serial trackball	A type of external pointing device (or portable mouse) that requires very little space or wrist movement to operate. It has a D-shaped 9-pin connector that plugs into the serial connector on the computer.
SETUP	The diagnostic utility that stores configuration information and sets the real-time clock/calendar. The SETUP utility is provided two ways: (1) installed in the computer read-only-memory (ROM) and (2) on the Diagnostics diskette. SETUP on the Diagnostics diskette contains help on the screen that is not available in the internal (ROM-based) SETUP.
Standby	The condition in which the computer is inactive and uses the least amount of battery power by shutting down most of the computer components. Standby can be system- or user-initiated.
standby button	A button on the keyboard that the user presses to initiate and terminate Standby.
static memory	A type of memory that does not need to be periodically rewritten (or refreshed) by the microprocessor to retain valid information.
syntax	The relationship (or order) between characters or symbols or groups of characters or symbols independent of their meanings or use.
System Idle	A reduced power condition that the system initiates during short periods of inactivity. During System Idle, the operating (processor) speed is slowed. Any activity restores the original display and speed settings.

system management mode	A power conservation option in the SETUP utility which disables power conservation and the hotkey functions, including the hotkey popup windows.
system prompt	A character or series of characters indicating that the operating system is ready to accept a command.

T

terminate-and-stay-resident (TSR) program	A program that loads into memory and can be activated when needed by pressing an associated key sequence. The program stays in memory, even if it is not being used, until the computer is turned off or restarted.
TEST	A diagnostic utility that determines if the computer components are recognized by the computer system and are functioning properly.
text mode	An operating mode that displays only the American Standard Code for Information Interchange (ASCII) character set on the screen. *Contrast with* graphics mode.
time-out	The amount of time in minutes of system or component inactivity before the computer shuts down the system or component to conserve battery power.
trackball orientation	The direction the cursor moves when you roll the ball with your thumb. The ball orientation can be changed for right- or left-handed use.

trickle charge	An ongoing charge to an almost fully charged battery pack by the AC Adapter or the optional Battery Fastcharger/Discharger. A trickle charge begins after the fast charge is complete.

U

upper memory	Unused memory between 640 and 1024 Kbytes that can be used for additional hardware or to access additional memory by using one of two interfaces: the Expanded Memory Specification (EMS) or the eXtended Memory Specification (XMS). The User Programs drivers and utilities, HIMEM, EXMEM, and CEMM, support these interfaces and permit MS-DOS applications to use the upper memory. The User Programs RUNHI utility loads the device drivers and terminate-and-stay-resident (TSR) programs into upper memory.
User Programs	COMPAQ utilities and device drivers that take advantage of the unique, advanced hardware features of the computer. These include utilities for memory management, power management, display attributes, and many others.
User Programs Configuration Utility	A program on the User Programs diskettes that assists in installing, updating, and configuring User Programs files.
utility	A support software program that performs system maintenance tasks required by many of the programs using the system.

V

video graphics adapter (VGA)	A video graphics standard that supports 16 gray shades at 640 x 480 graphics resolution and 720 x 400 text resolution.

W

WCURSOR	A Microsoft Windows utility that enhances the appearance of the Windows cursor. WCURSOR operates on all COMPAQ computers that support Windows 3.0 or higher.
write-protect	A procedure for preventing a diskette or tape from being written to by a diskette drive.

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